HABITAT CONSERVATION PLAN

BIOLOGICAL MONITORING PROGRAM

Comal Springs/River Aquatic Ecosystem

ANNUAL REPORT

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EXECUTIVE SUMMARY

The Edwards Aquifer Habitat Conservation Plan (EAHCP) Biological Monitoring Program continued to track biota and habitat conditions of the Comal Springs/River ecosystem in 2024 through a series of routine and Critical Period monitoring activities outlined in this report. Monitoring in the Comal system consisted of routine surveys specific to EAHCP Covered Species: Fountain Darter (*Etheostoma fonticola*), Comal Springs Salamander (*Eurycea* sp.), and multiple Comal Springs invertebrates. Community-level monitoring data were also collected on aquatic vegetation, fish, and benthic macroinvertebrates. In addition to routine monitoring, multiple Critical Period and species-specific low-flow sampling events were triggered as springflows remained at the lowest levels observed since the start of biological monitoring in 2000. Results from 2024 biological monitoring provided valuable data to further assess spatiotemporal trends of aquatic biota in the Comal Springs/River ecosystem, as well as a unique opportunity to better understand ecological responses under sustained low-flow scenarios.

In 2024, central Texas experienced continued drought conditions with low precipitation and higher ambient temperatures. Low-flow conditions in the Comal Springs/River System persisted from the previous year but were briefly interrupted by one temporary high flow event at the end of January. With minimal rain following this event, discharge stayed well below long-term median flows for the entire year and continued the decreasing trend observed since 2022. This resulted in a second year under the lowest flow conditions documented over the course of the 23-year biological monitoring program. When compared to previous drought years, median and minimum daily mean discharge were similar in 2024 (125 cubic feet per second [cfs] and 55 cfs, respectively) and 2023 (121 and 55 cfs, respectively), but both were lower than the previous monitoring program low observed in 2014 (135 and 65 cfs, respectively) and considerably lower than other drought years in 2009, 2011, and 2013. Monthly median discharges were below the long-term 10th percentiles throughout the year, except for the month of August when they approximated 10th percentile levels. Flows dropped below 100 cfs in June, resulting in one Critical Period sampling event. Small rain events in June and July slightly increased the aquifer level and helped total discharge remain around 100 cfs until flows began decreasing in mid-August. Although 2023 and 2024 shared similar annual median and minimum daily mean discharge values, the timing of the minimum flows varied. In 2023, the minimum mean daily flow was reached in August, aligning with the hottest air temperatures and fewest rain events. In 2024, flows remained low the entire year, but the same minimum mean daily flow (55 cfs) was not observed until October. This triggered habitat evaluations, discharge and flow partitioning measurements, and multiple species-specific events which were all coupled with routine fall monitoring.

Notable habitat degradations were observed at upper spring reaches and spring runs. As flows declined, atypically larger increases in temperature were observed near Upper Spring Run and Spring Island. While Upper Spring Run total vegetation coverage was higher than historical averages throughout the year, the dominant vegetation was the macroalgae *Chara* which proliferates in slackwater environments and has low Fountain Darter densities. Wetted surface habitat in spring areas was greatly reduced beginning in summer, leaving Spring Run 1 and the spring run at Spring Island completely dry through October. Furthermore, by fall sampling, the majority of salamander sampling area at Spring Island Outfall and Spring Run 3 were dewatered. The extent and duration of desiccation observed throughout spring areas resulted in obvious impacts to surface habitat for salamanders and spring-associated invertebrates. Salamanders were documented in all monitored spring runs in spring 2024, which followed several months of poor conditions (i.e., algae, desiccation) during summer 2023 and subsequent improved habitat conditions in fall 2023. However, improved conditions at the end of 2023 and beginning of 2024 did not remain long enough for salamander counts to rebound to long-term averages. *Eurycea* salamanders are known to use subsurface habitats and genomics data suggests that migration events are occurring between various spring locations within the Edwards Aquifer region (Devitt et al. 2019). Given their ability to occupy subsurface habitats and previous monitoring data showing recolonization after spring run desiccation events (e.g., 2014), it is assumed that salamanders will recolonize these areas as surface flow returns. However, additional monitoring is needed to confirm this as well as to evaluate recolonization rates and population responses.

Similar to salamanders, abundance estimates for *Stygobromus* sp. from spring drift-net sampling and Comal Springs Riffle Beetle from cotton-lure surveys were both down compared to historical data. Although drift-net counts of *Stygobromus* sp. are standardized per cubic meter of water, lower spring discharge may decrease the number of these organisms dislodged from near-spring environments. Across sites and seasons, a temporal decline in the number of Comal Springs Riffle Beetles observed per lure was noted when comparing 2024 data to 5-year and long-term datasets. In particular, abundance estimates have been low since fall 2021 suggesting population abundance was potentially impacted by low springflows observed the past three years. However, like the *Eurycea* salamanders described above, Comal Springs Riffle Beetles are capable of using sub-surface habitats. Therefore, reduced abundance on cotton lures set near spring surface habitats may not reflect a true population-level decline. A low-flow habitat utilization investigation conducted by BIO-WEST researchers as part of the species-specific triggered monitoring in fall 2023 suggested that Comal Springs Riffle Beetles follow water levels sub-surface when spring surface habitats dry up. Additional EAHCP research is currently being conducted to better understand Comal Springs Riffle Beetle population dynamics and its relationship to surface and subsurface habitat utilization.

The influence of extremely low springflows was also evident on abiotic habitat and aquatic vegetation conditions across all study reaches and resulted in an overall declining trend among Fountain Darter population metrics. Spring was the only season which approximated 5-year and long-term trends among all metrics. Fountain Darter densities met or exceeded long-term medians in April, but densities declined well below long-term values for all reaches by fall. Likewise, median CPUE and occurrence were greater in the spring than fall. In contrast, recruitment rates were lower than expected during the routine spring sampling event, which occurred during the Fountain Darter peak reproductive period. Lower recruitment during the June Critical Period at end of spring was not surprising given it occurred well after the typical period of peak reproduction. Declines in Fountain Darter population condition are likely the combined result of elevated summer water temperatures and changes in vegetation assemblages driven by low flows. Water temperature exceeded laboratory-estimated thresholds for maximum optimal Fountain Darter egg and larval production more commonly and for longer durations than during typical flow conditions at some upper spring stations.

After several years of continued low flows, a pattern of declining bryophyte coverage and increasing filamentous algae coverage has emerged in several study reaches. This was initially observed in Upper Spring Run, but the pattern appears to be extending to riverine reaches in 2024. The post-restoration vegetation community within the Old Channel has typically maintained high amounts of bryophytes over the past five years and Fountain Darter drop-net densities have remained near or above the long-term median for most events. However, fall 2024 deviated from this and demonstrated larger reductions in bryophytes and the lowest darter density observed over the past five years. Median densities in spring and fall have steadily declined since 2020 largely due to changes in suitable vegetation coverages (e.g., reductions in *Cabomba* and bryophytes). Although Landa Lake has maintained more vegetation and thermal stability than other reaches, it has also had the largest annual fluctuations in Fountain Darter densities over the past five years which could suggest that this reach is characterized by over-compensatory dynamics.

Asynchronous trends among Overall Habitat Suitability Index (OHSI) and Fountain Darter population metrics have become more apparent during low-flow years. For example, Upper Spring Run exhibited higher OHSI in 2024, largely due to increased coverage of filamentous algae, but Fountain Darter densities remained low. Additionally, Upper New Channel reach exhibited higher vegetation coverage and OHSI in 2024 which can be attributed to lack of scouring from high flow events within the Dry Comal Creek watershed. Despite the increased OHSI at Upper New Channel, low densities of Fountain Darters in spring and lack of Fountain Darters in fall were observed. This suggests that OHSI factors other than vegetation coverage and composition may be influencing Fountain Darter population dynamics under low flow conditions. Existing OHSI could benefit from incorporating other relevant habitat factors such as occurrence of bryophytes within other vegetation types and a water temperature component.

At a community scale, fish and macroinvertebrate community-level responses to low flows were not as evident as those within Covered Species populations. In 2024, reductions in spring fish relative density were noted in the New Channel. However, in general, no long-term temporal trends in overall or spring-associated fish diversity, richness, and relative density are evident from fish community monitoring data. Macroinvertebrate Index of Biotic Integrity (IBI) scores did show slight declines at some upper reaches (Upper Spring Run and Landa Lake) suggesting that low flows may have led to habitat homogenization and reduction in abundance of fluvial specialists in these areas. Though besides these minor deviations, fish and macroinvertebrate community data were generally comparable to historical data.

Overall, 2024 biological monitoring provided insights into the current condition of the EAHCP Covered Species in the Comal Springs/River System, as well as flow-ecology relationships related to the broader aquatic community. Similar to 2023, spring discharge in 2024 was among the lowest observed since initiation of biological monitoring in 2000. As a result, acute impacts to Covered Species habitats and resulting responses of population metrics were noted. Despite the extreme conditions observed, all Covered Species are still present at multiple habitats within the system and show potential to persist and rebound once more typical flow conditions return. Subsequent monitoring will be critical to assess the ultimate response of species populations to these unique, and at present, continuing stressors.

INTRODUCTION

The Edwards Aquifer Habitat Conservation Plan (EAHCP) is intended to provide assurance of suitable habitat for threatened and endangered species (i.e., Covered Species) (Table 1) in both the San Marcos and Comal Springs. Established in 2012, the EAHCP supports the issuance of an Incidental Take Permit that allows the "incidental take" of Covered Species from otherwise lawful activities in the Comal Springs system. Section 6.3.1 of the HCP established a continuation of biological monitoring in the Comal Springs/River. This biological monitoring program was first established in 2000 (formerly known as the Edwards Aquifer Authority [EAA] Variable Flow Study), and its original purpose was to evaluate the effects of variable flow on the biological resources of the Comal Springs/River, with an emphasis on threatened and endangered species. However, the utility of the HCP biological monitoring program has surpassed its initial purpose (EAHCP 2012). The biological data collected since the implementation of this monitoring program (BIO-WEST 2001–2024) now serves as the cornerstone for several underlying sections in the HCP, which include the following: (1) long-term biological goals (LTBGs) and management objectives (Section 4.1); (2) determination of potential impacts to Covered Species, "incidental take" assessment, and Environmental Impact Statement alternatives (Section 4.2); and (3) establishment of core adaptive-management activities for triggered monitoring and adaptive-management response actions (Section 6.4.3). Additionally, biological monitoring program data, in conjunction with other available information, are essential to adaptive management as the EAHCP proceeds. Current and future data collection will help assess the effectiveness and efficiency of certain EAHCP mitigation and restoration activities conducted in the Comal Springs/River and calculate the EAHCP habitat baseline and net disturbance determination and annual "incidental take" estimate (EAHCP 2012).

Table 1. Covered Species sampled for under the Edwards Aquifer Habitat Conservation Plan in the Comal spring and river ecosystems.

SCIENTIFIC NAME	COMMON NAME	ESA STATUS
Insects		
Haideoporus texanus	Edwards Aquifer Diving Beetle	Petitioned
Heterelmis comalensis	Comal Springs Riffle Beetle	Endangered
Stygoparnus comalensis	Comal Springs Dryopid Beetle	Endangered
Crustaceans		
Lirceolus smithii	Texas Troglobitic Water Slater	N/A
Stygobromus pecki	Peck's Cave Amphipod	Endangered
Amphibians		
Eurycea sp.	Comal Springs Salamander	N/A
Fish		
Etheostoma fonticola	Fountain Darter	Endangered

This report provides the methodology and results for biological monitoring activities conducted in 2024 within the Comal Spring/River ecosystem. In addition to routine monitoring, Critical Period and species-specific low-flow sampling were triggered. The results include summaries of current physiochemical conditions, as well as current conditions of floral and faunal communities, encompassing routine and low-flow sampling. For all aquatic organisms, historic observations (BIO-WEST 2001–2023a) are also used to provide context to current conditions.

METHODS

Study Location

The Comal Springs System is the largest spring complex in Texas. It encompasses an extensive headsprings system and the Comal River (New Braunfels, Comal County, Texas), and is fed by the Edwards Aquifer (Brune 2002). Dam construction and channelization during the late-1800s modified headspring habitats (Odgen et al. 1986; Crowe and Sharpe 1997) and drainage patterns of the river (Ottmers 1987). Impoundment of Comal Springs resulted in the formation of Landa Lake (Linam et al. 1993), which is fed by four spring runs of variable size (Ogden et al. 1986; Crowe and Sharpe 1997). From the headwaters, the river flows about 5 kilometers (km) before its confluence with the Guadalupe River. Under typical springflow conditions (>150 cfs), the majority of water that exits Landa Lake flows through the "New Channel", an engineered diversion that was originally created to act as a cooling system for a power generation plant. Under typical conditions, approximately 55-60 cfs are diverted to the original river channel, known as the "Old Channel," that rejoins the New Channel about 2.5 km downstream (Ottmers 1987). As springflow declines (<100 cfs), the flow split shifts, and proportionally more water is diverted to the Old Channel to maximize protection of habitat and maintain suitable water temperatures. For example, when total Comal springflow was approximately 60 cfs, ~35 cfs was sent down the Old Channel and 25 cfs was sent down the New Channel.

The watershed is dominated by urban landcover and is subjected to recreational use. Spring inputs from the Edwards Aquifer provide stable physiochemical conditions, and springflow conditions are dictated by aquifer recharge and human water use (Sung and Li 2010). In the 1950s, Comal Springs temporarily ceased flowing (Schneck and Whiteside 1976; Brune 2002). Despite this, the Comal Springs System maintains diverse assemblages of floral and faunal communities (Bowles and Arsuffi 1993; Crowe and Sharpe 1997) and includes multiple endemic aquatic organisms, such as Comal Springs Riffle Beetle, Peck's Cave Amphipod, Comal Springs Salamander, and Fountain Darter.

Sampling Strategy

Based on the long-term biological goals (LTBGs) and management objectives outlined in the HCP, study areas were established to conduct long-term monitoring and quantify population trends of the Covered Species (EAHCP 2012). The sampling locations selected are designed to cover the entire extent of Covered Species habitats, but they also allow for holistic ecological interpretation while maximizing resources (Figures 1–3).

Comprehensive sampling within the established study area varies temporally and spatially among Covered Species. The current sampling strategy includes five spatial resolutions:

1. System-wide sampling
    a. Aquatic vegetation mapping: 5-year intervals (winter)
2. Select longitudinal locations
    a. Water temperature monitoring: year-round at permanent monitoring stations
    b. Discharge measurements: 2 events/year (spring, fall)
3. Reach sampling
    a. Aquatic vegetation mapping: 2 events/year (spring, fall)
    b. Fountain Darter drop-net sampling: 2 events/year (spring, fall)
    c. Fountain Darter random-station dip-net surveys: 3 events/year (spring, summer, fall)
4. Springs Sampling
    a. Endangered Comal invertebrate sampling: 2 events/year (spring, fall)
    b. Comal Salamander surveys: 2 events/year (spring, fall)
    c. Fountain Darter visual surveys: 2 events/year (spring, fall)
5. River section/segment
    a. Fountain Darter timed dip-net surveys: 3 events/year (spring, summer, fall)
    b. Fish community sampling: 2 events/year (spring, fall)
    c. Macroinvertebrate community sampling: 2 events/year (spring, fall)

In addition to annual comprehensive sampling outlined above, low-flow sampling may also be conducted, but is dependent on HCP flow triggers, which include Critical Period Low-Flow Sampling and species-specific sampling (EAHCP 2012). Discharge decreased below 100 cfs in June, which resulted in a Critical Period low-flow full sampling event. Critical Period water grab sampling results are presented in Appendix B. Species-specific monitoring was conducted from June to November for the Fountain Darter and Comal Springs Riffle Beetle (Appendix A). Habitats were assessed at approximately every 10 cfs decline and thermistors were downloaded at regular intervals to ensure suitable Covered Species habitat availability and system stability.

The remaining methods sections provide brief descriptions of the procedures utilized for comprehensive sampling efforts, which includes details on all Critical Period and species-specific sampling efforts. A more-detailed description of the gear types used, methodologies employed, and specific GPS coordinates can be found in the Standard Operating Procedures Manual for the HCP biological monitoring program for the Comal Springs/River ecosystem (EAA 2017).

Comal River Discharge and Springflow

River hydrology in 2024 was assessed using US Geological Survey (USGS) stream gage data from January 1 to October 31. Mean daily discharge expressed in cubic feet per second (cfs) was acquired from USGS gage #08169000, which represents cumulative river discharge that encompasses springflow and local runoff contributions. It should be noted that some of these data are provisional and are subject to revision at a later date (USGS 2024). The annual distribution of mean daily discharge was compared for the past 5-years using boxplots. The distribution of 2024 mean daily discharge was summarized by month using boxplots. Monthly discharge levels were compared with long-term (1928–present) 10th, 50th (i.e., median), and 90th percentiles.

Discharge was also measured in spring and fall at five cross-section stations (Upper Spring Run, Spring Run 1, Spring Run 2, Spring Run 3, Old Channel) using a flowmeter and adjustable wading rod, with the exceptions of measurements at Spring Run 1 and Spring Run 2 in the fall due to dry conditions. Additional discharge measurements were conducted at all cross-section stations during the Critical Period event triggered in June (n = 1). Additionally, discharge was measured at four M9 stations (Spring Island Upper Far, Spring Island Lower Near, Spring Island Lower Far, Landa Lake Cable) by EAA personnel using a SonTek RiverSurveyor Acoustic Doppler Profiler (Figure 3). M9 station measurements were conducted during the same periods as cross-section stations, as well as during an additional event in August. EAA personnel also measured discharge at Spring Run 1–3 cross-section stations in June and August.

To quantify the contribution of each station to total system discharge, percent total discharge ([discharge(station *x*)/cumulative river discharge]*100) was calculated. Cumulative river discharge was based on the mean daily discharge value on the day of each measurement. Discharge and percent total discharge were summarized for spring, summer, and fall measurements, which were compared to 5-year and long-term (cross-section stations: 2003–present; M9 stations: 2014–present) averages ±95% confidence intervals using bar graphs. Results for cross-section stations are presented in the main body of the report and includes M9 measurements conducted in June (spring) and August (summer). Results for M9 stations can be found in Appendix E.

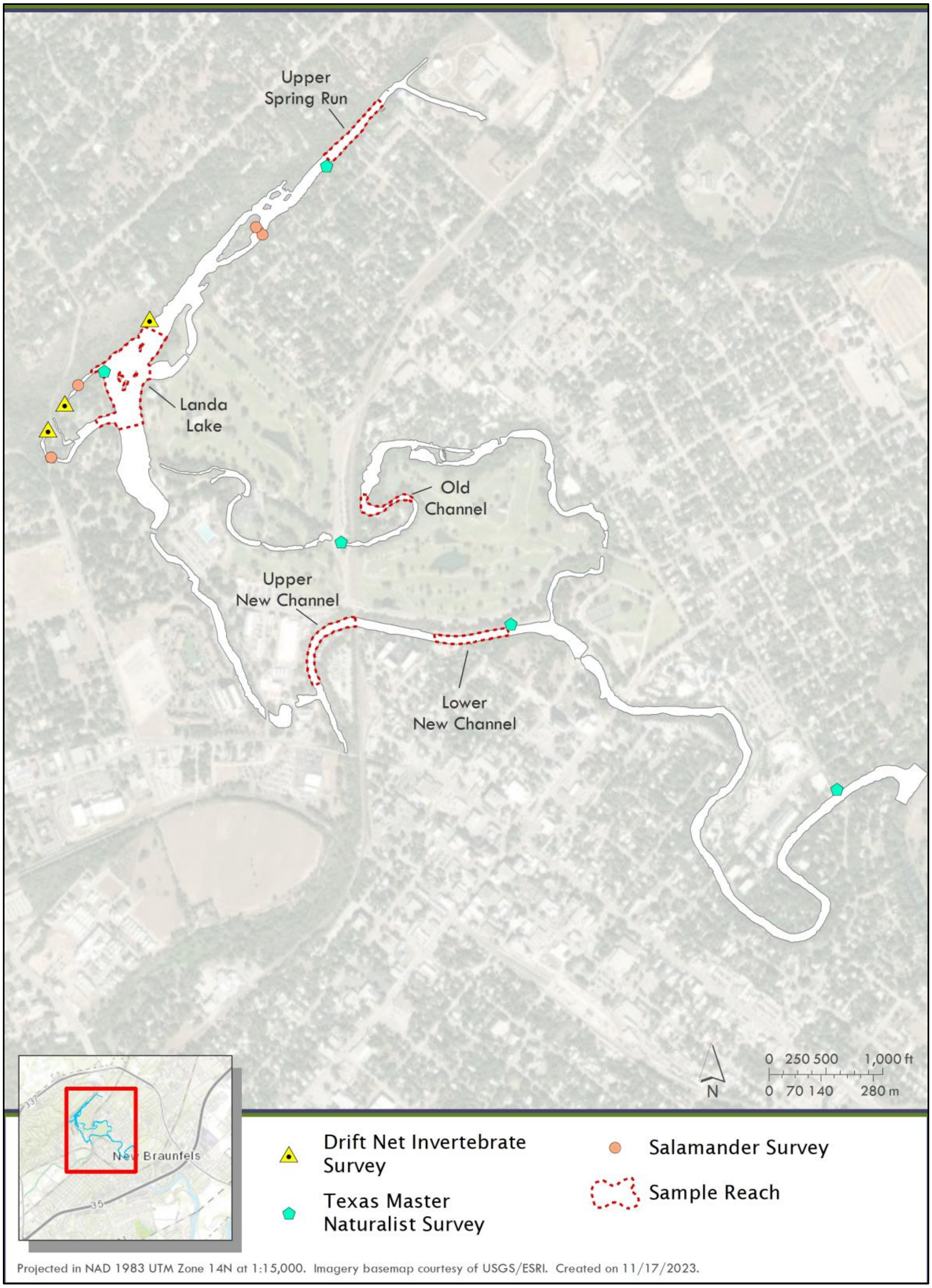

Figure 1. Locations of drift-net invertebrate, Comal Springs Salamander, Texas Master Naturalist, and biomonitoring (includes aquatic vegetation mapping, drop-net sampling, presence/absence dip-net sampling, and macroinvertebrate community sampling) sample areas within the Comal Spring/River study area.

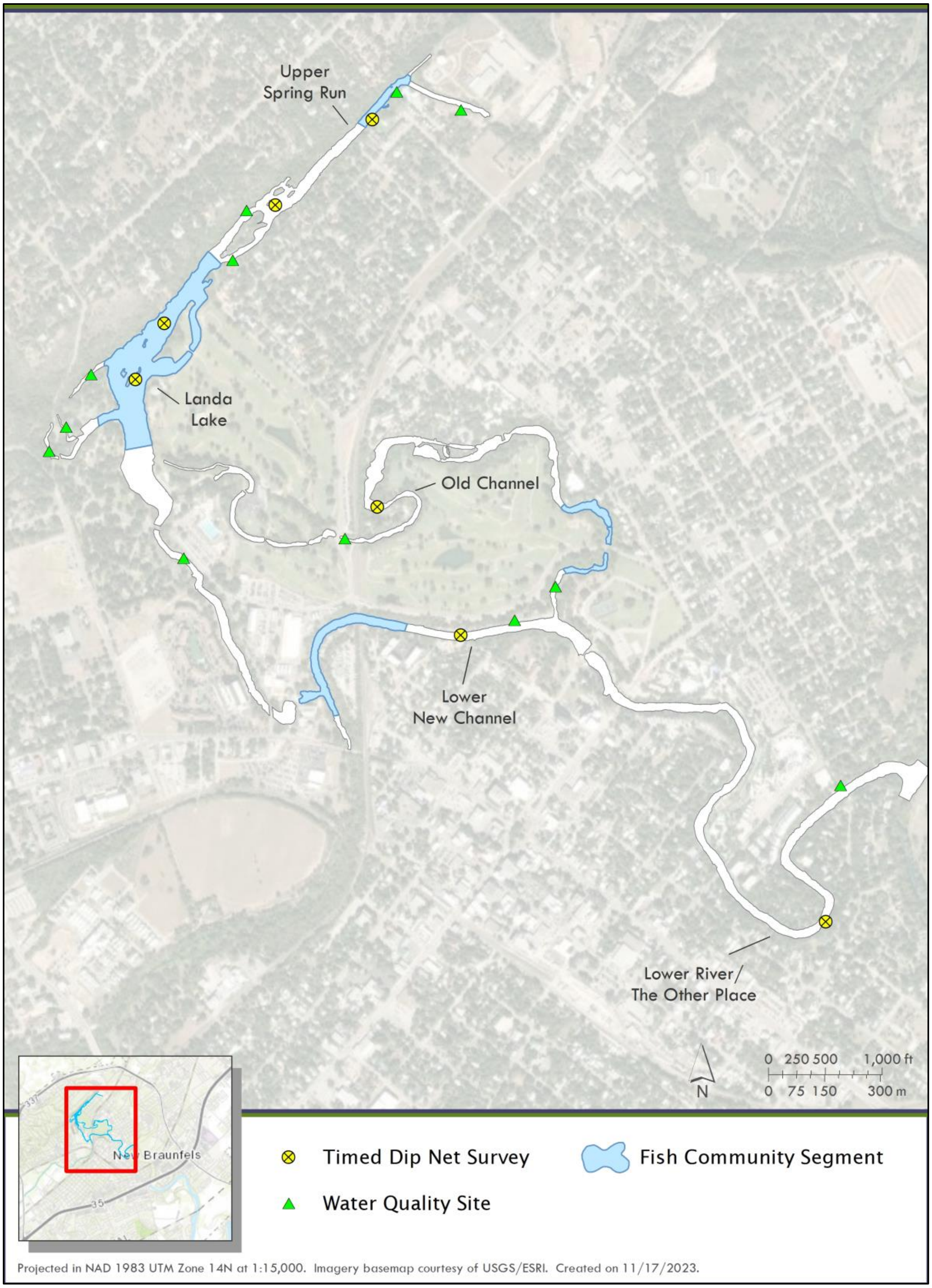

Figure 2. Locations of fish community, water quality, and Fountain Darter timed dip-net surveys within the Comal Springs/River study area.

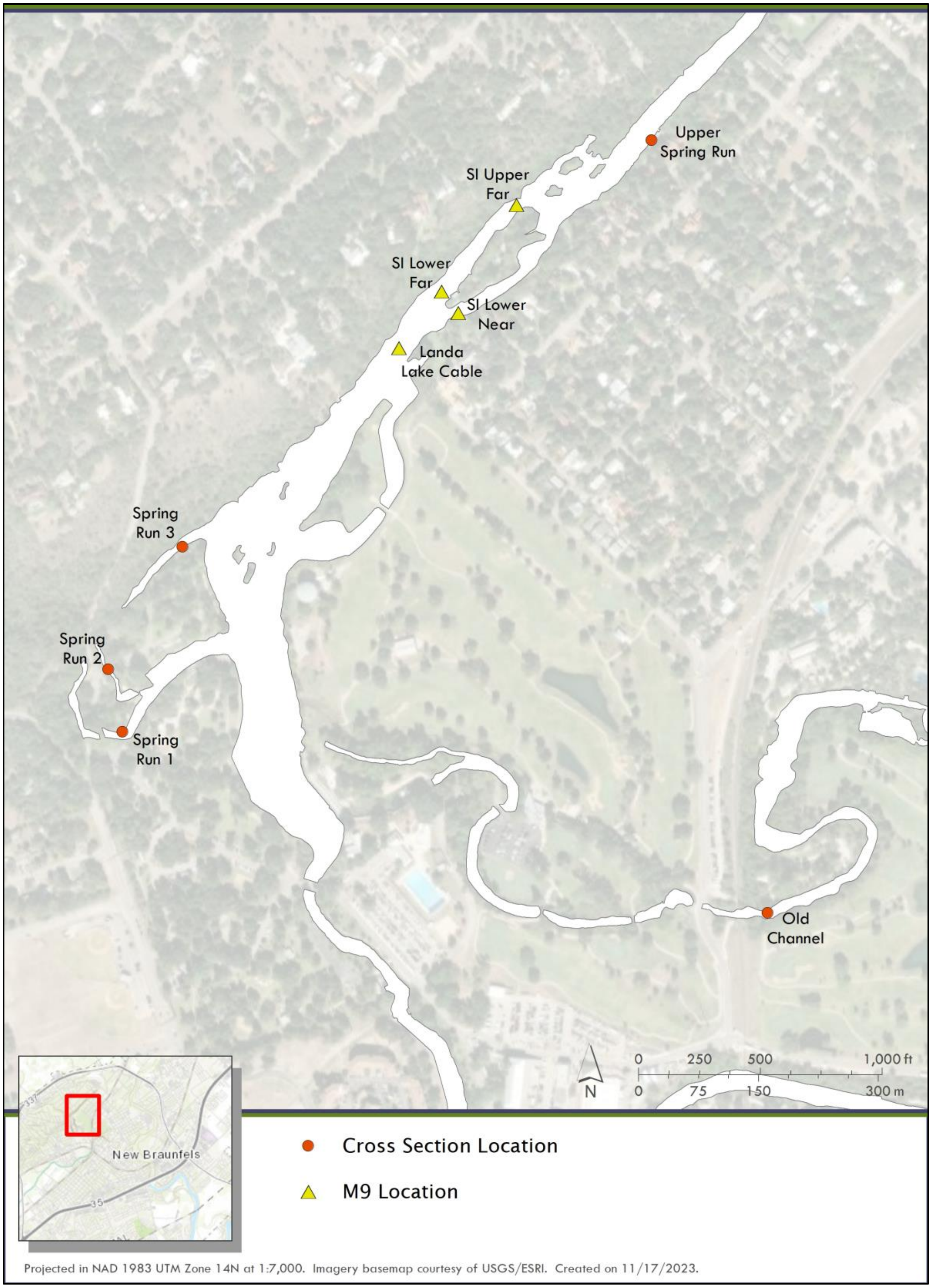

Figure 3. Cross-section and M9 discharge collection locations in the Comal Springs/River study area.

Water Temperature

Spatiotemporal trends in water temperature were assessed using temperature data loggers (HOBO Tidbit v2 Temp Loggers) at the 13 permanent monitoring stations established in 2000. Data loggers recorded water temperature every 10 minutes and were downloaded at regular intervals. Prior to analysis, data processing was conducted to locate potential data logger errors per station by comparing time-series for the current year with previous years. Timeframes displaying temperatures that deviated substantially from historical data and did not exhibit ecologically rational trends (e.g., discontinuities, ascending drift) were considered unreliable and omitted from the dataset. For analysis, the distribution of water temperatures for the current year was assessed among stations based on 4-hour intervals and summarized using boxplots. Data from the current year were also compared to their 5-year and long-term trends. Water temperatures were also compared with maximum optimal temperature requirements for Fountain Darter larval (≥25 °C) and egg (≥26 °C) production (McDonald et al. 2007). Further, 25 °C is also the designated threshold within the HCP Fountain Darter LTBGs study reaches (Upper Spring Run [Heidelberg], Landa Lake, New Channel, Old Channel) (EAHCP 2012). In the case of stations that surpassed either water temperature threshold during the year, the general timeframes in which those exceedances occurred are discussed in the text.

Texas Master Naturalist Monitoring

Volunteers with the Texas Master Naturalist program continued their monitoring efforts in 2024 at select locations along the Comal system. Volunteers collected water quality and recreation data at the following five sites: (1) Houston Street site within the Upper Spring Run reach, (2) Gazebo site within the Landa Lake reach, (3) Elizabeth Avenue site upstream of the Old Channel reach, (4) New Channel site within the New Channel reach, and (5) the downstream-most Union Avenue site (Figure 1). Volunteer monitoring was performed on a weekly basis, with surveys conducted primarily on Friday afternoons between 1200 and 1500 hours. At each site, an Oakton Waterproof EcoTester pH 2 was used to measure pH, and a LaMotte Carbon Dioxide Test Kit was used to measure carbon dioxide (CO_2) concentrations in the water column. In addition to water-quality measurements, recreational-use data were collected at each site by counting the number of tubers, kayakers, anglers, etc., within the survey site at the time of sampling. Volunteers also took photographs at each site during each sampling event, and occasionally made additional notes on recreational use or the condition of the river. Results from this monitoring effort can be found in Appendix D.

Aquatic Vegetation

Mapping

The team used a sit-in kayak to complete aquatic vegetation mapping in each sample reach during the spring, June Critical Period, and fall monitoring events (Figure 1). A Trimble GPS unit and external Tempest antenna set on the bow of the kayak was used to collect high-accuracy (10–60 centimeter [cm]) geospatial data. A data dictionary with pre-determined attributes was loaded into the GPS unit for data collection in the field. Discrete patch dimensions and the type and density of vegetation were recorded from the kayak. In some instances, an accompanying free diver was used to provide additional detail and to verify surface observations. The discreteness of an individual vegetation patch was determined by the dominant species located within the patch compared to surrounding vegetation. Once a patch of vegetation was visually delineated, the kayak was maneuvered around the perimeter of the vegetation patch to collect geospatial data with the GPS unit, thus creating a vegetation polygon. Attributes assigned to each polygon included species type and percent cover of each of the four most-dominant species. The type of substrate (silt, sand, gravel, cobble, organic) was identified if substrate was a dominant feature within the patch. Rooted aquatic vegetation, floating aquatic vegetation, bryophytes, and algae were mapped as separate features. Only aquatic vegetation patches 1 meter (m) in diameter or larger were mapped as polygons.

Data Processing and Analysis

During data processing, Microsoft pathfinder was used to correct spatial data and create shapefiles. Spatial data were projected using the Projected Coordinate System NAD 1983 Zone 14N. Post processing was conducted to clean polygon intersections, check for and correct errors, and calculate cover for individual discrete polygons as well as totals for all encountered aquatic plant species.

Vegetation types are described in the Results and Discussion section by genus. Vegetation community composition among taxa and grouped by native vs. invasive taxa are compared for the last five years using stacked bar graphs. Total surface area of aquatic vegetation, measured in square meters (m^2), is presented for each season using bar graphs and is compared with long-term averages (2001–present) from spring, fall, high-flow events, and low-flow events. High-flow and low-flow averages were calculated from Critical Period events. These events are based on predetermined river discharge triggers (Appendix A), which result in additional mapping events to assess flow-related impacts to the vegetation community.

Fountain Darter

Drop-Net Sampling

Drop-net sampling was utilized to quantify Fountain Darter densities and evaluate habitat utilization during the spring, June Critical Period, and fall monitoring events (Figure 1). Sample stations were selected using a random-stratified design. In each study reach, two sample stations per vegetation strata were randomly selected based on dominant aquatic vegetation (including open areas) mapped prior to sampling (see Aquatic Vegetation Mapping for details). At each sample station, all organisms were first trapped using a 2 m^2 drop-net. Organisms were then collected by sweeping a 1 m^2 dip net along the river bottom within the drop-net. If no fish were collected after the first 10 dip-net sweeps, the station was considered complete, and if fish were collected, an additional 5 sweeps were conducted. If Fountain Darters were collected on sweep 15, additional sweeps were conducted until no Fountain Darters were collected.

Most fishes collected were identified to species and enumerated. Two morphologically similar species, Western Mosquitofish (*Gambusia affinis*) and Largespring Gambusia (*Gambusia geiseri*), which are known to hybridize, were classified by genus (*Gambusia* sp.). Larval and juvenile fishes too small to confidently identify to species in the field were also classified by genus. All Fountain Darters and the first 25 individuals of other fish taxa were measured (total length in millimeters [mm]).

Physiochemical habitat data were collected at each drop-net location. Water depth in feet (ft) and velocity in feet per second (ft/s) were collected at the upstream end of drop-net samples using a flowmeter and adjustable wading rod. Water-velocity measurements were collected at 15 cm above the river bottom to characterize flows that directly influence Fountain Darters. Mean-column velocity was measured at 60% of water depth at depths of less than three feet. At depths of three feet or greater, water velocities were measured at 20% and 80% of depth and averaged to estimate mean column velocity. Water quality was measured within each drop-net using a multiprobe, which included water temperature (degrees Celsius [°C]), pH, dissolved oxygen (milligrams per liter [mg/L], percent saturation), and specific conductance (microsiemens per centimeter [µs/cm]). Mid-column water quality was measured at water depths of less than three feet, whereas bottom and surface values were measured and averaged at depths of three feet or greater. Lastly, vegetation composition (%) was visually estimated and dominant substrate type was recorded within and around each drop-net sample.

Dip-Net Sampling

Dip-net sampling was used to provide additional metrics for assessing Fountain Darter population trends and included qualitative timed surveys and random-station presence/absence surveys. All sampling was conducted using a 40x40-cm (1.6-mm-mesh) dip-net, and surveys for both methods were conducted in spring, summer, and fall. Spring sampling included one Critical Period event in addition to the routine spring monitoring.

Timed dip-net sampling was conducted to examine patterns in Fountain Darter abundance and size structure along a more extensive longitudinal gradient compared to drop-net sampling. Surveys were conducted within established monitoring sites for a fixed amount of search effort (Upper Spring Run: 0.5 hour, Spring Island: 0.5 hour, Landa Lake: 1 hour, Old Channel: 1.0 hour, New Channel: 1.0 hour, Lower River: 1.0 hour) (Figure 2). In each study reach, a single surveyor used a dip-net to collect Fountain Darters in a downstream to upstream fashion. Collection efforts mainly focused on suitable Fountain Darter habitat, specifically in areas with dense aquatic vegetation. Non-wadable habitats (>1.4 m) were not sampled. All Fountain Darters collected were enumerated, measured (mm), and returned to the river at point of collection.

Random-station presence/absence surveys were implemented to assess Fountain Darter occurrence. During each monitoring event, sampling stations were randomly selected within the vegetated area of each sample reach (Upper Spring Run: 5, Landa Lake: 20, Old Channel: 20, New Channel: 5) (Figure 1). At each random station, presence/absence was recorded during four independent dips. To avoid recapture, collected Fountain Darters were returned to the river in areas adjacent to the random station being sampled. Habitat variables recorded at each station included dominant aquatic vegetation, and presence/absence of bryophytes and algae.

Visual Surveys

Visual surveys with the aid of SCUBA gear were conducted at Landa Lake in areas too deep for implementing the Fountain Darter sampling methods described above (Figure 1). Sampling occurred during the spring and fall monitoring events. To standardize data relative to any potential diel patterns in behavior, observations were conducted in early afternoon during each sampling event. A specially designed grid (7.8 m^2) was used to quantify the number of Fountain

Darters using these deeper habitats. During each survey, all Fountain Darters within the grid were counted and the percentage of bryophyte coverage within the grid was recorded. Results of visual surveys are presented in Appendix E.

Data Analysis

Key demographic parameters used to evaluate Fountain Darter observations included population performance, size structure, and recruitment. Population performance was assessed using drop-net, timed dip-net, and random dip-net data. Counts of darters per drop-net sample were standardized as density (darters/m^2). Timed dip-net total darter counts per study reach were standardized as catch-per-unit-effort (CPUE; darters/person-hour [p-h]) for each sampling event. Random dip-net occurrence per station was based on whether or not a Fountain Darter was observed during any of the four dips and percent occurrence was calculated per sampling event at each reach as: (sum[darter presence]/sum[random stations])*100. Fountain Darter density, CPUE, and percent occurrence were compared among seasons using boxplots. In addition, most seasonal observations were compared to observations from the past five years and long-term observations (2001–present). Lastly, temporal trends in Fountain Darter density were assessed per sampling event for each study reach over the past five years using boxplots and compared to their respective long-term (2001–present) medians and quartiles (25th and 75th percentile).

Size structure and recruitment were assessed among seasons. Fall and spring were assessed by combining drop-net and timed dip-net data, and summer was assessed only using timed dip-net data. Boxplots coupled with violin plots were used to display the distribution of darter lengths per sampling event during each season for the past five years. Boxplots show basic length-distribution statistics (i.e., median, quartiles, range) and violin plots visually display the full distribution of lengths relative to each sampling event using kernel probability density estimation (Hintze and Nelson 1998). Recruitment was quantified as the percent of darters ≤20 mm during each sampling event. Based on a linear model built by Brandt et al. (1993) that looked at age-length relationships of laboratory-reared Fountain Darters, individuals of this size are likely less than 3 months old and not sexually mature (Brandt et al. 1993; Schenck and Whiteside 1976). Percent recruitment ±95% confidence intervals (i.e., beta distribution quantiles; McDonald 2014) were shown for the past five years by season and compared to their respective long-term averages. Size structure and recruitment in spring 2024 were analyzed separately for the routine (April 25–May 1st) and critical period (June 11–17) events to distinguish between the peak reproductive period from late-winter to early-spring and periods of lower output from late-spring to mid-summer (Schenck and Whiteside 1977).

Habitat use was assessed based on population performance and size structure among vegetation strata using drop-net and random-station dip-net observations. Fountain Darter density by vegetation taxa was compared based on current, five-year, and long-term (2001–present) observations using boxplots. Proportion of occurrence was also calculated among vegetation types sampled during random-station dip-netting for the current year. Lastly, boxplots coupled with violin plots were used to display the distribution of darter lengths by vegetation taxa using drop-net data to examine habitat use among size classes for the current year.

Habitat suitability was quantified to examine reach-level changes in habitat quality for Fountain Darters through time. First, Habitat Suitability Criteria (HSC) ranging from 0 (unsuitable habitat) to 1 (most suitable habitat) were built based on occurrence data for all vegetation types (including open habitat) that have been sampled using logistic regression (Manly et al. 1993). Resulting HSC were then multiplied by the areal coverage of each vegetation strata mapped during a biomonitoring event, and results were summed across vegetation strata to calculate a weighted usable area for each reach. To make data comparable between reaches of different sizes, the total weighted usable area of each reach was then divided by the total area of the reach, resulting in an Overall Habitat Suitability Index (OHSI) for each reach during each sampling event. Following this method, temporal trends of Fountain Darter OHSI ±95% CI were calculated per sampling event for each study reach (Upper Spring Run, Landa Lake, Old Channel, Upper New Channel, Lower New Channel) for the past five years. Long-term (2003–present) OHSI and 95% CI averages were also calculated to provide historical context to recent OHSI observations. Data analyses were modified from previous calculations of OHSI for Upper Spring Run and included the addition of green algae (i.e., *Chara*, *Nitella*) due to *Chara* representing as much as ~50% of the vegetation community. Specific details on the analytical framework used for developing OHSI and evaluating its efficacy as a Fountain Darter habitat index, including methods to build HSC, can be found in Appendix H.

Fish Community

Mesohabitat, Microhabitat, and Seine Sampling

Fish community sampling was conducted in the spring, June Critical Period event, and fall to quantify fish assemblage composition/structure and to assess Fountain Darter population performance in river segments and habitats (e.g., deeper areas) not sampled during drop-net and timed dip-net surveys. The following four monitoring segments were sampled: Upper Spring Run, Landa Lake, Old Channel, and New Channel (Figure 2). Deeper habitats were sampled using visual transect surveys, and shallow habitats were sampled via seining.

A total of three mesohabitat transects were sampled at each segment during visual surveys. At each transect, four divers swam from bank-to-bank at approximately mid-column depth, enumerating all fishes observed and identifying them to the lowest possible taxonomic level. After each mesohabitat transect was completed, microhabitat sampling was also conducted along four, 5-meter-long PVC pipe segments (micro-transect pipes) placed on the stream bottom, spaced evenly along the original transect. Divers started at the downstream end and swam up the pipe searching through the vegetation, if present, and substrate within approximately 1 m of the pipe. All fishes observed were identified to species and enumerated. For both surveys, any individuals that could not be identified to species were classified by genus. At each micro-transect pipe, total area surveyed (m^2), aquatic vegetation composition (%), and substrate composition (%) were recorded. Water depth (ft) and velocity (ft/s) data were collected in the middle of each micro-transect pipe using a portable flowmeter and adjustable wading rod. Water-velocity measurements were taken 15 cm from the bottom, mid-column, and at the surface. Standard water-quality parameters were also recorded once at each mesohabitat transect using a handheld water-quality sonde.

In shallow habitats, at least three seining transects were sampled within each monitoring segment (except for Landa Lake). At each of these, multiple seine hauls were pulled until the entire wadable area had been covered. After each seine haul, fish were identified, measured (mm), and enumerated. Total area surveyed (m^2) was visually estimated for each seining transect. Habitat data from each seine haul location included substrate and vegetation composition (%); water depth (ft); and velocity (ft/s) measured at 15 cm above the river bottom, at mid-column, and at the surface. Fish taxonomy herein follows the most recent guide published by the American Fisheries Society (AFS 2023).

Data Analysis

To evaluate fish community results, all analyses were conducted using fishes identified to species; fishes identified to genus or family were excluded. Total counts of species from independent samples were first quantified as density (fish/m^2) to standardize abundance among the three gear types used.

Based on microhabitat sampling, temporal trends in Fountain Darter density were assessed per sampling event for each study reach for the past five years using boxplots and compared to their respective long-term (2014–present) medians and quartiles. Overall species richness and diversity using the Shannon's diversity index (Spellerberg and Fedor 2003) for each study segment was assessed for the past five years and plotted with bar graphs. Richness and relative density (%; [sum(species *x* density)/sum(all species density)]*100) of spring-associated fishes (Table 2) were also quantified and presented in the same manner as species richness and diversity.

Table 2. Spring-associated fishes within the Comal Springs System based on Craig et al. (2016).

SCIENTIFIC NAME	COMMON NAME
Dionda nigrotaeniata	Guadalupe Roundnose Minnow
Notropis amabilis	Texas Shiner
Astyanax argentatus	Texas Tetra
Gambusia geiseri	Largespring Gambusia
Etheostoma fonticola	Fountain Darter
Etheostoma lepidum	Greenthroat Darter
Percina apristis	Guadalupe Darter
Percina carbonaria	Texas Logperch

Comal Springs Salamander Surveys

In spring and fall, biologists performed timed visual surveys for Comal Springs Salamanders within the four following established sampling areas: Spring Run 1, Spring Run 3, Spring Island Spring Run, and Spring Island East Outfall (Figure 1). One additional Critical Period sampling event occurred in June. Timed surveys involved sampling from downstream to upstream within the extent of the sampling area. Biologists inspected under rocks within the top 5 cm of the substrate surface and within aquatic vegetation to quantify salamanders while moving upstream toward the main spring orifice. A dive mask and snorkel were utilized to view organisms, as depth permitted. Locations of all Comal Springs Salamander observations were recorded using pin flags. Following survey completion, and water depth (ft) and presence/absence of vegetation were noted to potentially serve as a baseline assessment of habitat parameters should the salamander population change significantly in subsequent sampling years. To account for any potential diel patterns in behavior, all surveys were initiated in the morning and completed by early afternoon.

Survey effort was previously fixed during routine sampling. Within Spring Run 1, a one-hour survey was conducted from the Landa Park Drive Bridge upstream to just below the head spring orifice. Spring Run 3 was surveyed for one hour from the pedestrian bridge closest to Landa Lake upstream to the second pedestrian bridge. Surveys in the Spring Island area were divided into the following two sections: (1) one 30-minute survey of Spring Island Run and (2) one 30-minute survey of the east outfall upwelling area on the east side of Spring Island near Edgewater Drive. Based on this, effort across all sites represents a total of 6 person-hours (p-h) under the established monitoring methodology. However, reduced habitat availability associated with low-flow conditions experienced from 2022-2024 required modification in search times. Specifically, total survey effort at each site was adjusted relative to the percent of wetted habitats available for salamanders at a given sampling event. For example, if wetted habitats were reduced by 50% at Spring Run 1, a 50% reduction in survey time was implemented (i.e., 30 minutes).

Data Analysis

Comal Springs Salamander counts and CPUE (salamanders/p-h) were used to assess seasonal and five-year trends, respectively. Data from all sampling events in 2024 were used for analysis despite varied search effort at each site. Since adjustments in search time were scalable, varied effort offset differences in total survey area, providing statistically valid comparisons in catch rates. Salamander counts were presented for each season using bar graphs and are compared with long-term (2001–present) spring, fall, high-flow event, and low-flow event averages. High-flow and low-flow event averages were calculated from Critical Period Events. These events are based on predetermined river discharge triggers (Appendix A), which result in additional survey events to assess flow-related impacts to the Comal Springs Salamander population. Temporal trends in salamander density were also assessed per sampling event for each sampling area for the past five years using bar graphs.

Macroinvertebrates

Drift-net Sampling and Data Analysis

Macroinvertebrate samples were collected via drift-net at three sites in the Comal system. During each comprehensive sampling event, drift-nets were placed over the major spring openings of Comal Spring Runs 1 and 3 and a moderate-sized spring upwelling (Spring 7) along the western shoreline of Landa Lake; alternate locations were used in Spring Run 1 when no water was observed at the major opening (Figure 1). Drift-nets were anchored into the substrate directly over each spring opening, with the net facing perpendicular to the direction of flow. Net openings were circular with a 0.45-m diameter, and the mesh size was 100 micrometers (µm). The tail of the drift-net was connected to a detachable, 0.28-m-long cylindrical bucket (200 µm mesh), which was removed at 6-hour intervals during sampling, after which cup contents were sorted and invertebrates removed in the field. The remaining bulk samples were preserved in ethanol and sorted later in the laboratory, where minute organisms that had been overlooked in the field were removed. All Comal Springs Riffle Beetles, Peck's Cave Amphipods, and Comal Springs Dryopid Beetles captured via drift-net were returned to their spring of origin, with the exception of voucher organisms (fewer than 20 living specimens of each species identifiable in the field). All non-endangered invertebrates were preserved in 70% ethanol. Additionally, water-quality measurements (temperature, pH, conductivity, dissolved oxygen, and current velocity) were taken at each drift-net site using a water-quality meter and handheld flow meter.

The total numbers of endangered species at each site are presented in the results and a summary of total numbers for all taxa can be found in Appendix E. Temporal trends in *Stygobromus pecki* per cubic meter were assessed per sampling event for each sampling area over the past five years using boxplots and compared to their respective long-term (2003–present) medians and quartiles (25th and 75th percentile).

Comal Springs Riffle Beetle Sampling and Data Analysis

Comal Springs Riffle Beetles were collected from three areas in the Comal River system during two routine sampling events in spring and fall. Two additional species-specific sampling events occurred from July through October. Sampling followed the methods of the Cotton Lure standard operating procedure developed for the HCP (EAA 2017). This methodology consists of placing lures of 15x15 cm pieces of 60% cotton/40% polyester cloth into spring openings/upwellings in the Comal system, where they remain in situ for approximately 30 days. During this time, they become inoculated with local organic and inorganic matter, biofilms, and invertebrates, including Comal Springs Riffle Beetles. These lures were placed in sets of 10 in the following three areas: (1) Spring Run 3, (2) along the western shoreline of Landa Lake ("Western Shoreline"), and (3) near Spring Island. Due to declines in wetted habitats in the summer, alternate sampling methods were implemented during low-flow sampling events to limit disturbance from over sampling. For the two additional low-flow events (July 2nd to August 12th and September 9th to October 8th), lures were set in collaboration with an ongoing study of Comal Springs Dryopid Beetle. Lures were placed in the most suitable habitat available at each site and remained in situ for about 30 days. Lures lost, disturbed, or buried by sedimentation were not included in subsequent analyses. Numbered tags placed on the banks of Spring Run 3 and Western Shoreline were utilized, when possible, to identify lure locations.

Comal Springs Riffle Beetles collected with cotton lures were identified, counted, and larvae were returned to their spring of origin during each sampling effort. A dissecting scope with a maximum magnification of 90x was used to correctly identify riffle beetles in the field. The sampling crew also recorded counts of *Microcylloepus pusillus*, Comal Springs Dryopid Beetle, Peck's Cave Amphipod, and *Lirceolus* pp. collected on lures. Some adult Comal Springs Riffle Beetles, Comal Springs Dryopid Beetles, and Peck's Cave Amphipods were retained by SMARC personnel for incorporation into the refugia program. Any other spring invertebrates collected on the lures were also placed back into their spring of origin. Crews utilized a mask and snorkel to place and remove lures in areas with deeper water depths.

Adult Comal Springs Riffle Beetle relative abundance (beetles/lure) were compared among seasons for each area using boxplots. In addition, seasonal observations were compared to five-year and long-term observations (2004–present). Temporal trends in relative abundance were also assessed per sampling event for each area for the past five years using boxplots and compared to their respective long-term (2004–present) medians and quartiles (25th and 75th percentile). Data collected during the two low-flow sampling with alternate methods were omitted from all analyses. Due to variation in sampling sites and methodology, these data were not directly comparable to routine biomonitoring events, and were instead summarized for each event separately, based on total adult Comal Springs Riffle Beetle counts per site.

Rapid Bioassessment Sampling and Data Analysis

Rapid bioassessment protocols (RBPs) are tools for evaluating biotic integrity and overall habitat health based on the community of organisms present (Barbour et al. 1999). Macroinvertebrates are the most frequently used biological units for RBPs because they are ubiquitous, diverse, and there is an acceptable working knowledge of their taxonomy and life histories (Poff et al. 2006, Merritt et al. 2008).

BIO-WEST performed sampling and processing of freshwater benthic macroinvertebrates, following Texas RBP standards (TCEQ 2014). Macroinvertebrates were sampled with a D-frame kick net (500 µm mesh) by disturbing riffle or run habitat (consisting primarily of cobble-gravel substrate) for five minutes while moving in a zig-zag fashion upstream. Invertebrates were then haphazardly distributed in a tray and subsamples were taken by scooping out haphazard portions of material and placing them into a separate sorting tray.

All macroinvertebrates were picked from the tray before another subsample was taken. This process was continued until a minimum of 140 individuals were picked to represent a sample. If the entire sample did not contain 140 individuals, the process was repeated again until this minimum count was reached. Macroinvertebrates were collected in this fashion from Upper Spring Run, Landa Lake, Old Channel, New Channel, and the Lower River (Other Place) reaches (Figure 1).

Picked samples were preserved in 80% denatured ethanol, returned to the laboratory, and identified to established taxonomic levels (TCEQ 2014), usually genus. Members of the family Chironomidae (non-biting midges) and class Oligochaeta (worms) were retained at those taxonomic levels. The 12 ecological metrics of the Texas RBP benthic index of biotic integrity (B-IBI) were calculated for each sample. Each metric represents a functional aspect of the macroinvertebrate community related to ecosystem health, and sample values are scored from 1 to 4 based on benchmarks set by reference streams for the state of Texas. The aggregate of all 12 metric scores for a sample represent the B-IBI score for the reach that sample was taken from. The B-IBI point-scores for each sample are compared to benchmark ranges and are described as having aquatic-life-uses of “Exceptional”, “High”, “Intermediate”, or “Limited”. In this way, point-scores were calculated and the aquatic-life-use for each sample reach was evaluated. Temporal trends in B-IBI scores were assessed per sampling event for each reach during the past five years using bar graphs.

RESULTS and DISCUSSION

In 2024, central Texas experienced a continuation of low precipitation and higher than normal ambient temperatures that began in 2022. By fall, drought conditions worsened to extreme (as designated by the National Weather Service [NWS]), covering large portions of the Hill Country, including the Edwards Aquifer Recharge Zone. As described in the next section, total river discharge in the Comal System was below the long-term 10th percentile for most of the year, continuing the declining trend observed since 2022. In 2023, flows declined to levels which had not been observed since 2014. Variability in flow magnitude has remained low since 2023 (~50 cfs) with only one temporary high-flow event (>90th percentile magnitude) occurring in January 2024. Similar median annual mean daily discharge and minimum mean daily discharge were observed in 2023 (121 cfs and 55 cfs, respectively) and 2024 (125 cfs and 55 cfs, respectively). Median and minimum mean daily discharge were lower in both years than in 2014 (135 and 65 cfs, respectively) and lower than other low-flow years in 2009, 2011, and 2013 (195–255 and 111–159 cfs, respectively). Despite the sustained low-flow conditions experienced in 2024, water quality parameters measured during Critical Period sampling were within the range of historical observations (Appendix B, Table B1 and B2; Crowe and Sharp 1997). Nitrate concentrations were similar to historical data (0.97–1.74 mg/L; Crowe and Sharp 1997) at all stations in both spring (i.e., Spring Runs, Landa Lake) and riverine (i.e., lower Old Channel and New Channel) habitats. See Appendix B for a complete summary of water quality data collected during Critical Period low-flow sampling.

Habitat quality for the Covered Species varied spatially as flows declined. Aquatic vegetation coverage in Upper Spring Run and Upper New Channel exceeded long-term expectations, while vegetation coverage in Landa Lake and Old Channel were well below long-term averages. Declines in bryophyte abundance were observed throughout the system, including in the Old Channel. Fountain Darter egg and larval production thresholds were exceeded more frequently in 2024 at Blieders Creek, Heidelberg, and Booneville Far than at other stations which corresponded with degraded Fountain Darter population condition at Upper Spring Run and Spring Island. Water temperatures were also elevated at Old Channel and New Channel, which coupled with declines in suitable aquatic vegetation (e.g., *Cabomba* and bryophytes) and reduced flow, possibly resulted in a synergistic negative effect on Fountain Darters in these areas. Habitat for Comal Springs Salamander (i.e., Spring Runs) and invertebrates (i.e., Spring Runs and Landa Lake's western shoreline) were noticeably reduced as water levels decreased. Most notably, the entire Comal Springs Salamander survey areas at Spring Run 1 and the spring run on Spring Island were dry and a majority of the area was dry at Spring Island Outfall and Spring Run 3 during the lowest flows.

In summary, total river discharge in the Comal System in 2024 repeated patterns observed the previous year with the lowest sustained flows observed since the inception of biological monitoring in 2000. Based on past habitat and species responses to low-flow conditions observed in 2014, it remains important to keep tracking the system-wide Fountain Darter and surface-dwelling invertebrate habitat conditions as these lower-than average discharge levels continue to persist. The remaining sections of the Results and Discussion describe current trends in river discharge, water temperature, Covered Species populations, and select floral and faunal communities through the Comal Spring/River System during this low-flow year.

River Discharge and Springflow

Low flow conditions continued to persist in 2024. Over the last five years, median annual mean daily discharge decreased from 2020 (275 cfs) to 2024 (125 cfs), representing a decline from ~38th to ~6th percentile of long-term median daily discharge (1928-2024), respectively. Minimum discharge also decreased from 2020 (235 cfs) to 2024 (55 cfs). Further, annual minimum daily discharges observed in 2023 and 2024 represent the first years that mean daily magnitudes were below 60 cfs (i.e., 2nd percentile) since 1990 (USGS 2024). Maximum annual daily discharge was highest in 2021 (1,850 cfs), representing a >99th percentile event, and was lowest in 2023 (259 cfs). The maximum discharge in 2021 was the only time when a >1,000 cfs high pulse event occurred. In addition, median discharge was at similarly low magnitudes from 2022 to 2024 (122–134 cfs), though variation in discharge (i.e., interquartile range) decreased from 132 cfs to ~50 cfs, with flows in 2023 and 2024 displaying similar levels of stability to 2020 (55 cfs) and 2021 (27 cfs). General distributional patterns of river discharge were similar between 2023 and 2024. That said, high flow events >90th percentile magnitude (394 cfs) occurred in 2024 (n = 3 days) and were absent in 2023 (Figure 4A).

Monthly median discharges were below their respective long-term medians for the entirety of 2024. Monthly medians decreased from January (149 cfs) to October (63 cfs). Median discharge per month was 1.7 (February) to 4.5 (October) times lower than long-term median discharge. Further, median discharge only aligned with the long-term 10th percentile in August, and was 1.1 to 1.3 times lower in all other months except October, which was 2.4 times below its long-term 10th percentile. Minimum monthly discharge was >100 cfs from January to April (133–168 cfs) and decreased from 98 cfs in May to 55 cfs in October. Mean daily river discharge only exceeded 90th percentile magnitudes in January (>407 cfs). Maximum discharge for the remaining months rarely exceeded 10th percentile flows. As such, flow variability was higher in January (63 cfs) compared to other months (12–30 cfs) (Figure 4B).

Cross-section discharges in spring habitats were below historical means for the majority of measurements in 2024 and decreased from spring to fall across all stations. Upper Spring Run was still flowing in spring. All spring runs showed slight increases in discharge from spring to summer, which was likely explained by increased aquifer level in the recharge zone at the end of July (J-17 Index Well: + ~8 ft; EAA 2024). Upper Spring Run was not measured in summer 2024, though likely also experienced a similarly small increase during this time period. By fall, discharge at Upper Spring Run, Spring Run 1, and Spring Run 2 decreased to 0 cfs. Spring Run 3 discharge also decreased in fall but remained flowing (0.67 cfs). Since the inception of the monitoring program, discharge at Spring Run 3 has never dropped to 0 cfs. That said, the only periods when Spring Run 3 fell to magnitudes <1 cfs were in summer 2023 and fall 2024. Discharge at the Old Channel decreased in 2024 and fall discharge was below historical averages. Similar to 2023, the percent total discharge at Old Channel in 2024 was higher than what is typical and directly related to lower contributions from spring runs (Figure 5) and EAHCP flow split management.

One noteworthy flow event not captured by river discharge and springflow analyses was a sub daily period of limited to zero flow (21.5 hours) that occurred at Old Channel as a result of construction maintenance contractor miscommunication. Based on USGS gage #08168913, discharge on October 22nd decreased from 36 cfs at 10:00 am to 0 cfs at 3:30 pm, and remained at 0 cfs until it increased to 25 cfs on October 23rd at 1:00 pm (USGS 2024). See subsequent sections for further discussion.

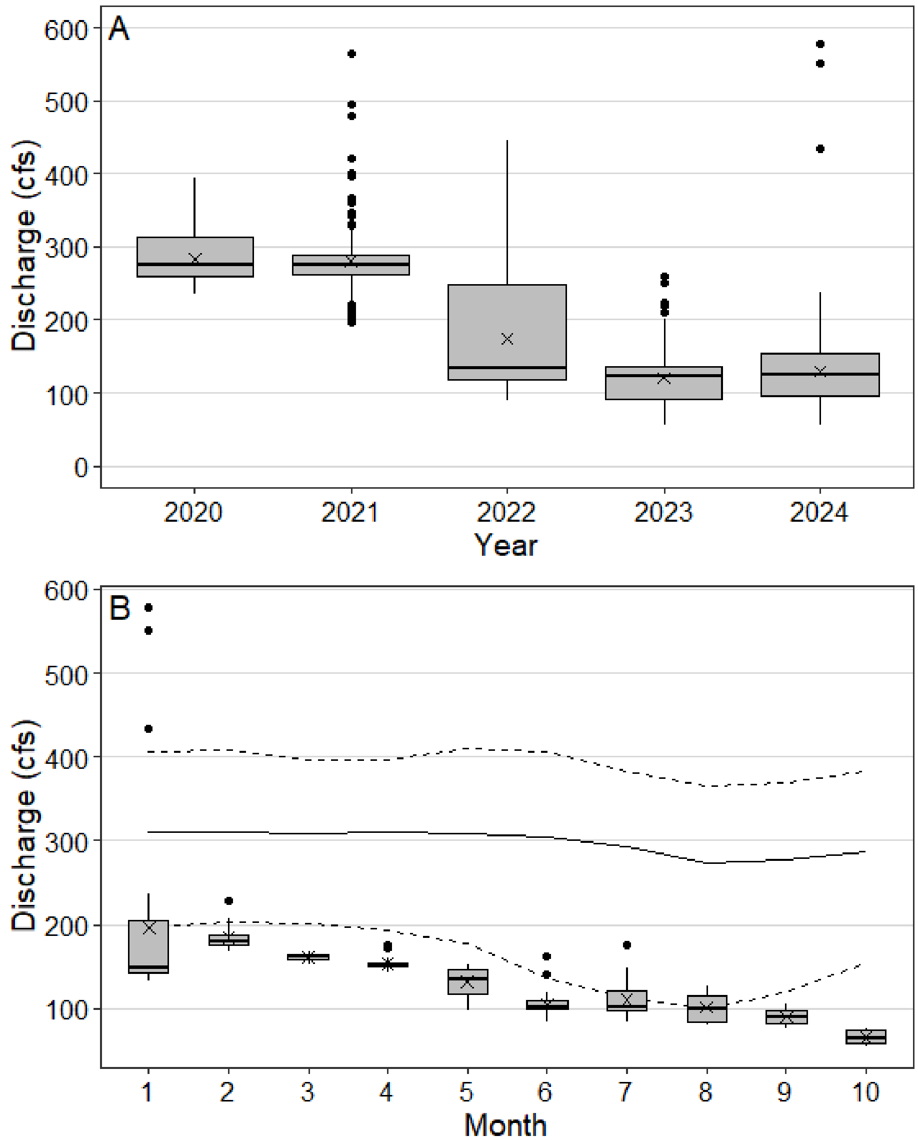

Figure 4. **Boxplots displaying Comal River mean daily discharge annually from 2020–2024 (A) and among months (January–October) in 2024 (B). Each month is compared to the 10th percentile (lower dashed line), median (solid line), and 90th percentile (upper dashed line) of their long-term (1956–2024) daily means. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range, and outliers beyond this are designated with solid black circles. One outlier for year 2021 in panel A is not shown (1,850 cfs).**

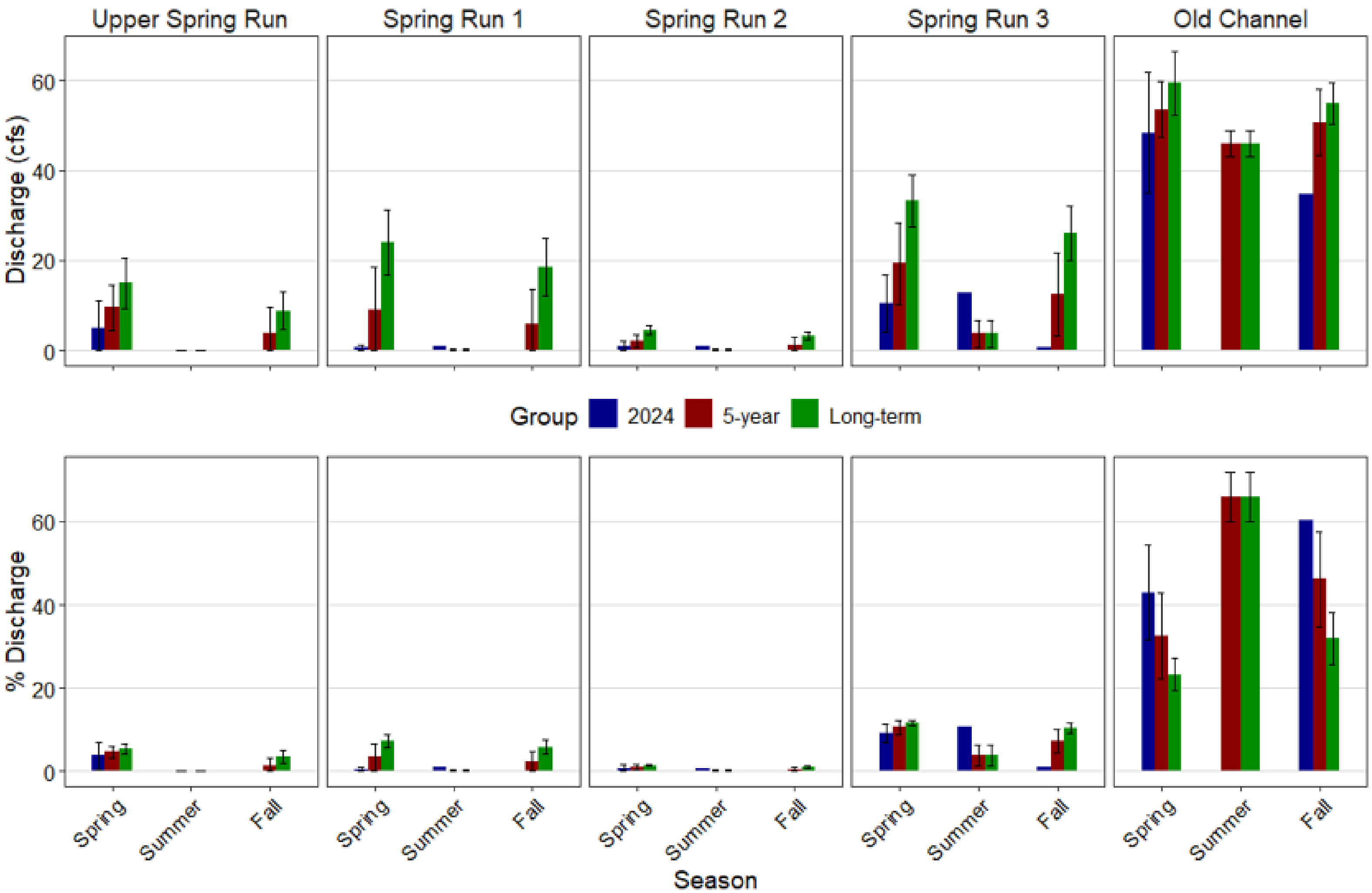

Figure 5. **Current (blue bars), five-year (2020–2024; red bars), and long-term (2003–2024; green bars) discharge and percent total discharge based on spring and fall cross-section measurements in the Comal Springs/River. Five-year and long-term values are represented as means and error bars denote 95% confidence interval**

Water Temperature

Water temperature gradients were spatially variable in Comal Springs (stations include Blieders, Heidelberg, Booneville Near, Booneville Far, Landa Lake Upper, Spring Run 1, Spring Run 2, Spring Run 3, and Landa Lake Lower). Median water temperature decreased from Blieders Creek (26.1 °C) to Booneville Near (23.9 °C), but increased at Booneville Far (27.4 °C). Moving downstream, median temperature decreased to stable levels at Landa Lake Stations (~23.8 °C) and its associated spring runs (~23.4 °C). Higher median water temperatures in Comal Springs were associated with more frequent temperatures >26 °C at Blieders Creek and Booneville Far, both showing greater temperatures in 2024 compared to 5-year and long-term values (Figure 6). Other stations in Comal Springs were more similar to historical expectations. Temperatures also surpassed 26 °C at Heidelberg and Spring Run 2, though were infrequent and considered outliers. The remaining stations in Comal Springs never exceeded 25 °C. In riverine environments (stations include Old Channel, New Channel Upstream, New Channel Downstream, and Other Place), median water temperature was similar between stations (23.8–24.1 °C) but illustrated a trend of increasing variability (i.e., interquartile range) from Old Channel (1.8 °C) and New Channel Upstream (1.5 °C) to Other Place (3.0 °C). Temperatures greater than 25 °C were generally rare across riverine stations but relatively more common at Other Place. Water temperatures exceeding 26 °C occurred more frequently at upper spring stations. All riverine stations generally aligned with historical data, though the upper quartile water temperature at Other Place was higher than the 5-year and long-term values (Figure 6).

Longitudinal trends displayed by riverine stations in 2024 aligned with expectations for spring-associated systems, increasing in magnitude and variation farther downstream from spring inputs (Groeger et al. 1997, Kollaus and Bonner 2012). In contrast, spatially variable temperature gradients observed in Comal Springs this year were atypical compared to historical data. Larger increases in water temperatures at Heidelberg and Booneville Far were associated with decreases in local springflow discharge that began in June at Upper Spring Run and Spring Island, respectively. That said, the remaining stations did not show similar increases in temperature. This suggests effects of reduced springflow in 2024 on patterns in local water temperatures varied spatially and was dependent on the contributions of proximal springs.

The Fountain Darter larval production threshold (25 °C) was exceeded from February to October. In Comal Springs, this threshold was exceeded >10 days per month at Heidelberg in June, September, and October, at Booneville Far in May, and Spring Run 2 in August. Larval threshold exceedance within riverine stations increased from early spring (~1–5 days per month) to July (25–30 days). Exceedance frequencies decreased through October, but were still higher than observations in early spring and occurred for ~50% of each month (10–17 days). In addition, monthly patterns in exceedance of the optimal egg production threshold (26 °C) were more frequent than larval production at Heidelberg and Booneville Far, occurring almost every day in July and August. Egg production exceedance occurred roughly 15–20 days per month through October 2024 at these two stations. At riverine stations, temperatures above the egg production threshold increased from early spring (~2 days per month) to June (~ 25 days) and decreased to zero in October at all stations except Old Channel (3 days).

At stations with higher water temperatures, Fountain Darter larval and/or egg production thresholds were mostly exceeded from spring to summer in 2024. Exceedance of these early life stage thresholds does not typically occur during the period of peak Fountain Darter reproduction in spring, which may explain why recruitment in April 2024 was lower than expected and the majority of recent recruits were observed at Landa Lake, where water temperatures remained at optimal levels. In contrast, historical data shows it is common for some 4-hour water temperature measurements to exceed these thresholds for ≥ 10 days per month in summer. This would indicate that lower population condition for Fountain Darters at Upper Spring Run, Spring Island, Old Channel, and New Channel in fall 2024 were not due to elevated summer water temperatures. However, it is possible that increased temperatures starting in spring resulted in a cumulative effect on Fountain Darters that eventually manifested by fall (Shreck 2000). Alternatively, elevated temperatures, reduced flows, and decreased coverages of suitable vegetation might have had a negative synergistic effect on the population (Matthaei and Lange 2016) (see Fountain Darter sections for further discussion).

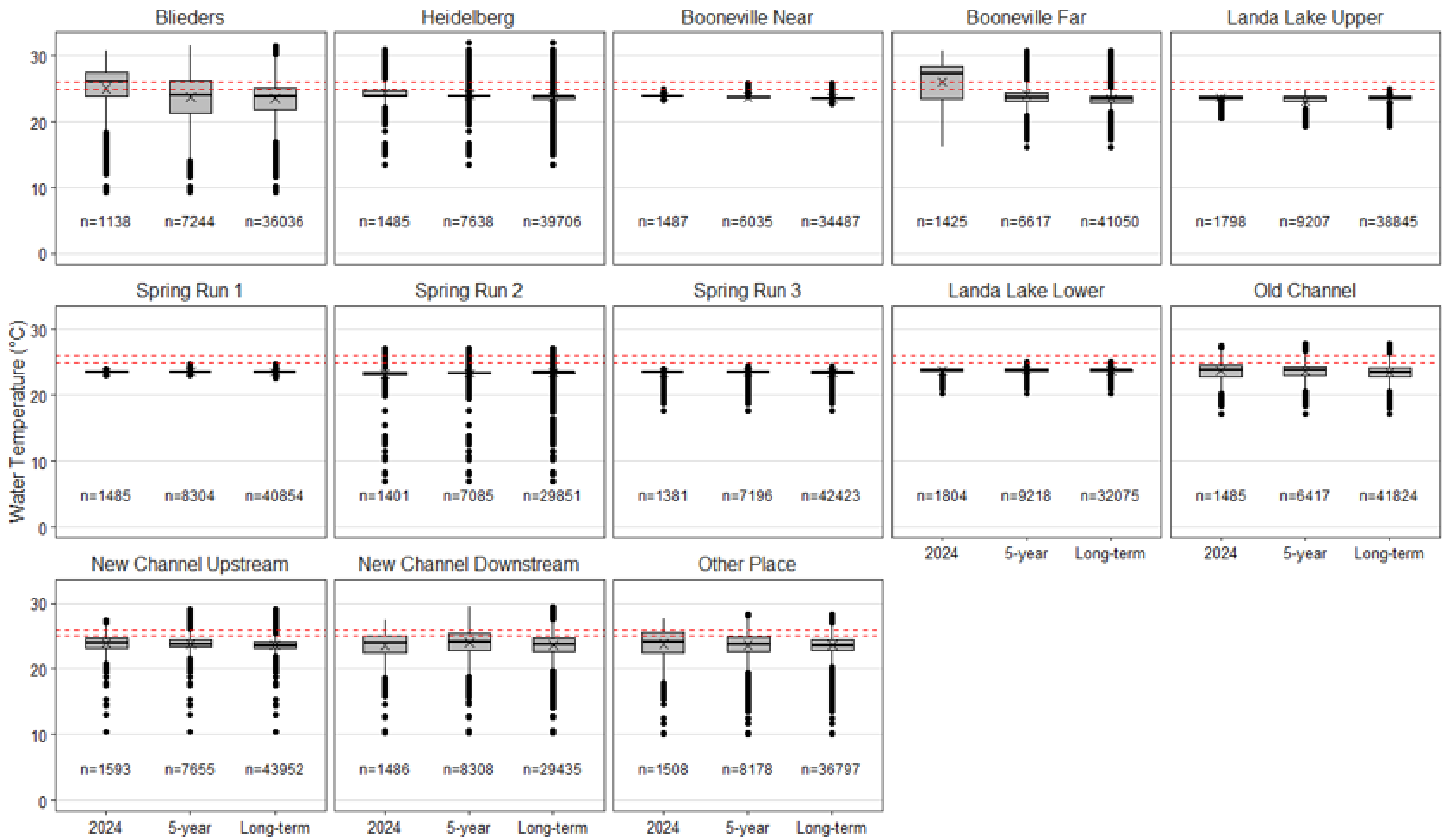

Figure 6. **Boxplots displaying 2024, 5-year (2020–2024), and long-term (2020–2024) water temperature trends in the Comal Springs/River. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range, and outliers beyond this are designated with solid black circles. The "n" values along the x-axis represent the number of individual temperature measurements in each category. The lower and upper red dashed lines indicate maximum optimal temperatures for Fountain Darter larval (≥25 °C) and egg (≥26 °C) production (McDonald et al. 2007), respectively.**

Aquatic Vegetation

Long-term Biological Goal Reach Mapping

Long-term biological goal reach mapping occurred in spring and fall, as well as low-flow events in June and August.

Upper Spring Run Reach

Low springflows due to the ongoing drought continued to impact the Upper Spring Run reach throughout 2024. Despite this, both spring and fall vegetation cover were above their respective long-term averages (Figure 7). Aquatic vegetation coverage was highest in the spring (2,679 m^2) and lowest in the fall (2,044 m^2), with total coverage during both low-flow events remaining in between (Figure 7). Consistent low flows contributed to higher sediment deposition and less scouring which allowed for the expansion of vegetation such as *Chara* and *Cabomba*. The macroalgae *Chara* was the most dominant vegetation in the spring, June low-flow, and fall events, while *Sagittaria* dominated in the August low-flow event. *Cabomba* increased in cover from 50 m^2 in the spring to a maximum of 182 m^2 in the June low-flow event. Total *Cabomba* coverage then decreased in subsequent events, although it remained above 100 m^2. Benthic and epiphytic algae, dominated by *Spirogyra*, were absent or less prominent in the spring and June low-flow events but increased considerably by the fall (823 m^2) (Figure 7). Bryophytes were largely absent across all mapping events with the exception of 150 m^2 in the spring. Reduced bryophyte coverage represents a continuation of the declining trend in this reach which has likely been influenced by low flows from 2022 through 2024 (Figure 8).

Landa Lake Reach

Total aquatic vegetation coverage was similar in spring (13,230 m^2) and fall (13,900 m^2), yet coverages for both seasons were below their respective long-term seasonal averages (Figure 7). Vegetation coverage was highest in the June (14,897 m^2) and August (14,391 m^2) low-flow events. Compared to other study reaches, aquatic vegetation coverage in Landa Lake typically exhibits less impact from flow disturbance events and less inter- and intra-annual variability. As in previous years, dominant vegetation taxa at Landa Lake were *Vallisneria* and *Sagittaria*. Both taxa are strongly rooted and exhibit consistent coverage across seasons (BIO-WEST 2001-2024). *Vallisneria* accounted for greater than 50% of the total coverage throughout 2024; however, it did retreat in some areas of the lake which was likely due to reduced water velocities and vegetation mats that limited sunlight. Reduced coverage can also partially be attributed to 2024 EAHCP restoration activities which included placing tarps over areas of *Vallisneria*. Denuded areas due to natural reductions and restoration activities appeared below the Landa Lake islands and along the eastern edge. Similar to 2023, *Cabomba* coverage in 2024 (668 m^2 – 880 m^2) was greater than previous years with higher flow (e.g., 2019-2021) when coverage ranged from 239 m^2 to 432 m^2. Expansion of *Cabomba* beginning in 2022 likely occurred as a result of reductions in *Vallisneria* and active planting related to HCP restoration activities. Bryophytes were not abundant in Landa Lake during any mapping event and continued to follow the decreasing trend of recent years (Figure 8). Epiphytic and benthic algae were present in varying abundance throughout Landa Lake. The annual Comal River Restoration Report provides more information regarding the restoration of native vegetation in the Landa Lake reach (BIO-WEST 2024b).

Old Channel Reach

In the Old Channel reach, total rooted vegetation in 2024 was well below the long-term averages for all events. The lowest rooted vegetation coverage occurred in the June low-flow event (252 m^2) and the highest coverage occurred in the fall (320 m^2) (Figure 7). However, non-rooted bryophyte coverage was highest in the June low-flow event (521 m^2) and lowest in the fall (196 m^2). This coverage was not represented in total areal coverage calculations presented in Figure 7, which exclusively quantify rooted vegetation. *Ludwigia* coverage has fluctuated since 2020, but it has remained an important component of the vegetation assemblage over this time period. Beginning in 2023, *Cabomba* coverage declined and was completely absent by spring 2024. *Cabomba* remained absent until the fall of 2024 when a small patch (8 m^2) was documented (Figure 8). Rooted vegetation coverages in the past several years being well below long-term averages were due to *Hygrophila* historically dominating the reach prior to restoration activities in 2013. Since restoration activities removed *Hygrophila* in this reach, the dominant taxa from year to year are now bryophytes and epiphytic filamentous algae. As such, lower overall coverages relative to the pre-HCP timeframe should not be interpreted as an indicator of degraded conditions but instead represent an improvement in Fountain Darter habitat conditions within this reach. However, in fall 2024, filamentous algae was more prevalent than bryophytes (Figure 8) which warrants concern and future monitoring.

Upper New Channel Reach

In the spring and fall of 2024, vegetation coverage was higher than average in the Upper New Channel (Figure 7). Spring vegetation coverage decreased from 1,809 m^2 to 1,218 m^2 in the June low-flow event. After this, vegetation coverage began increasing to its peak at 2,172 m^2 in the August event with coverage remaining similar in the fall (2,167 m^2). *Hygrophila* expanded throughout 2024 with the highest coverage occurring in fall (2,037 m^2). Aquatic vegetation coverage was impacted by heavy recreation in the early summer months, but it quickly rebounded in the fall. In addition to reduced recreation, increased vegetation in this reach can likely be attributed to the prolonged absence of flood pulses in Dry Comal Creek which prevents scouring. Unlike previous years, bryophytes were completely absent in this reach during all of 2024. In fall 2023, large reductions in bryophyte abundance were observed along with increases in filamentous algae (BIO-WEST 2024). Filamentous algae remained abundant in 2024, ranging from 283 m^2 to 1,024 m^2 (Figure 8).

Lower New Channel Reach

The spring and fall coverages for 2024 in the Lower New Channel were greater than their respective long-term averages, with an increasing trend from spring to fall (Figure 7). Vegetation coverage began at 2,292 m^2 in the spring and decreased to the lowest coverage during the June low-flow event (959 m^2). The large reduction in vegetation was a direct result of high recreation and reduced water depth. This reach is typically too deep for wading, but depths were approximately 2 ft in most areas during 2024 low flows which allowed recreators to wade in the channel and disturb the substrate. Coverage increased throughout the remainder of the year to 2,533 m^2 in the fall. A large decrease in *Cabomba* was the driving factor in reduction of overall vegetation coverage. The two dominant taxa in this reach, *Cabomba* and *Hygrophila*, lose biomass during higher flows or recreation, but can quickly recover once river conditions stabilize. This seasonal pattern in recreation influence was also observed in 2023 as the spring, July, and August mapping demonstrated consecutively lower coverages, with a subsequent gain in fall.

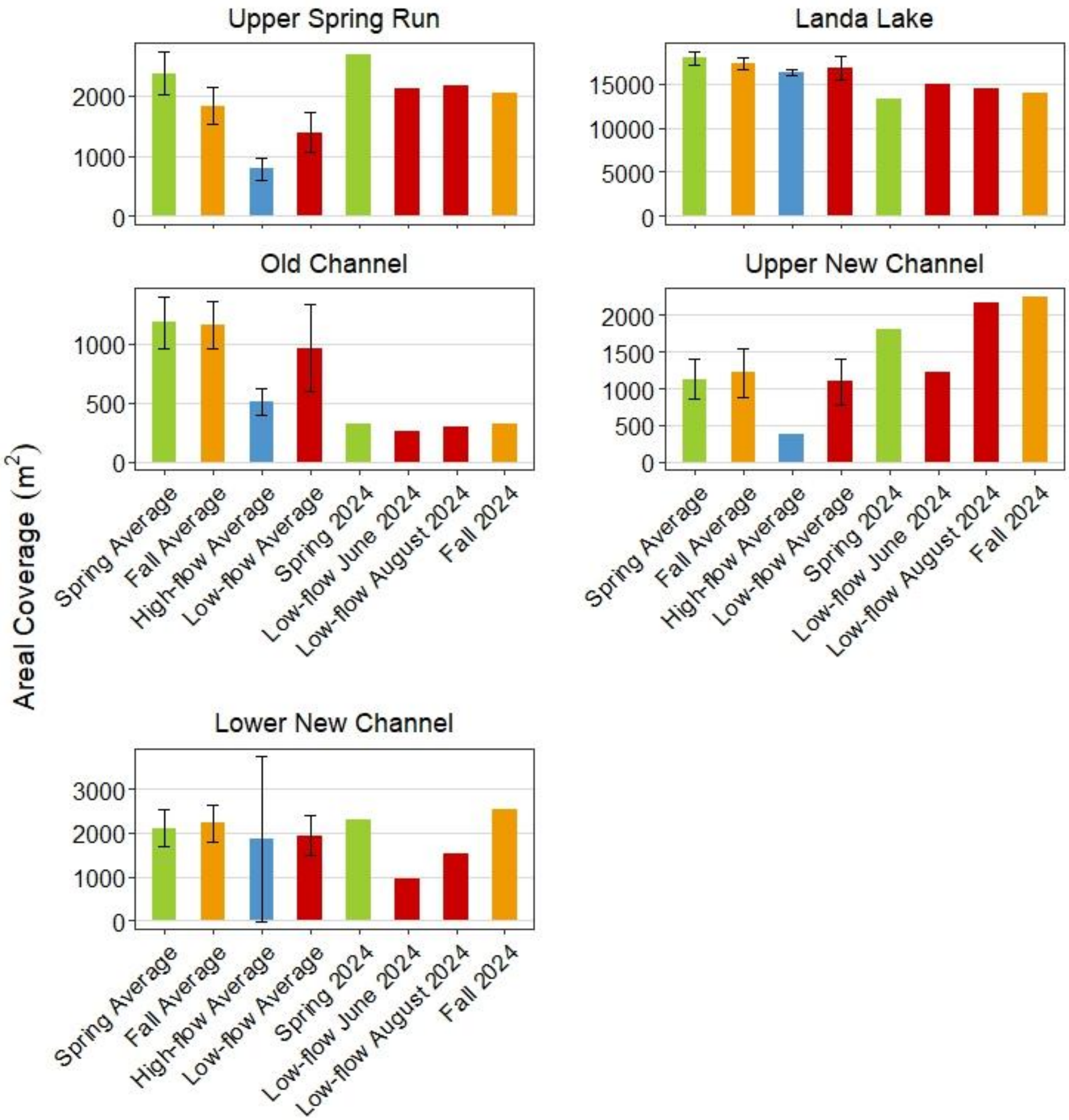

Figure 7. **Areal coverage (m^2) of rooted aquatic vegetation among study reaches in the Comal Springs/River. Long-term (2001–2024) study averages are provided with error bars representing 95% confidence intervals.**

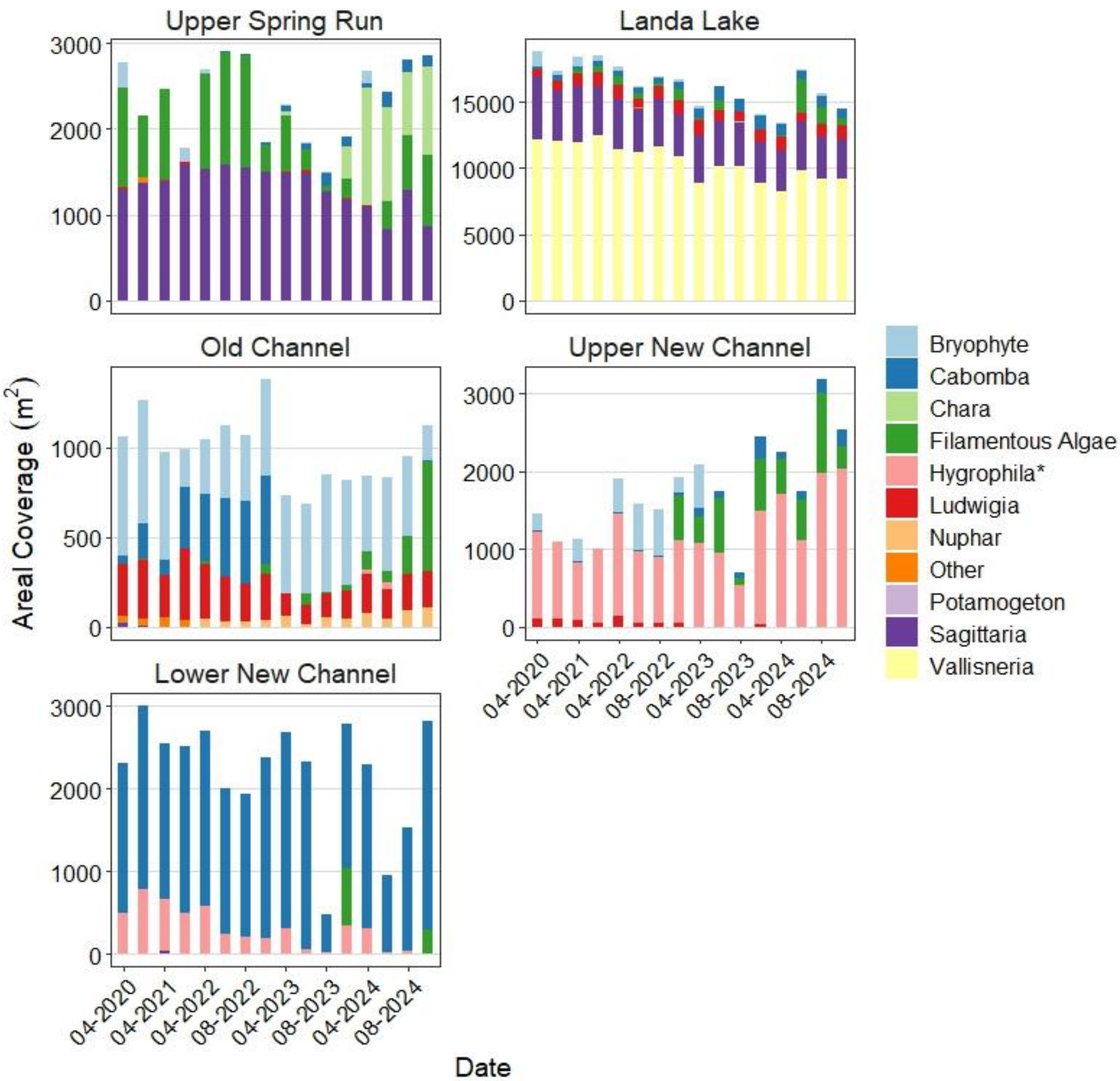

Figure 8. Aquatic vegetation coverage (m²) among taxa from 2020–2024 in the Comal Springs/River. (*) in the legend denotes non-native taxa.

Fountain Darter

A total of 1,835 Fountain Darters were observed at 98 drop-net samples in 2024. Drop-net densities ranged from 0.00–93.00 darters/m^2. Community summaries and raw drop-net data are included in appendices E and G, respectively. Summaries of habitat conditions observed during drop-netting can be found in Table 3. Timed dip-netting resulted in a total of 933 Fountain Darters during 20 person-hours (p-h) of effort. Site CPUE ranged from 0–180 darters/p-h. Lastly, Fountain Darters were detected at 96 out of 200 (48%) random-stations and reach-level percent occurrence among monitoring events ranged from 0–100%. A summary of occurrences per reach and vegetation taxa can be found in Table 4. Visual surveys in Landa Lake resulted in 39 darters observed and densities ranged from 1.54–3.46 darters/m^2 (bryophyte coverage = 15–35%) (Appendix E, Figure E11).

Table 3. Habitat conditions observed during 2024 drop-net sampling in the Comal Springs/River. Physical habitat parameters include counts of dominant vegetation (median % composition) and dominant substrate type sampled. Depth/velocity and water quality parameters include medians (min-max) of each variable among all drop-net samples.

HABITAT PARAMETERS	USR	LL	OC	NC
Vegetation				
Bryophyte[1]	6 (70%)	6 (50%)	6 (100%)	0
Cabomba[1]	2 (85%)	6 (100%)	0	6 (100%)
Chara[1]	6 (100%)	0	0	0
Hygrophila[1]	0	0	0	6 (100%)
Ludwigia[1]	0	6 (100%)	6 (100%)	0
Open	6 (98%)	6 (95%)	6 (95%)	6 (100%)
Sagittaria[2]	6 (100%)	6 (100%)	0	0
Vallisneria[2]	0	6 (100%)	0	0
Substrate				
Cobble	10	4	7	0
Gravel	10	4	2	5
Sand	0	7	3	3
Silt	6	21	6	10
Depth-velocity				
Water depth (ft)	2.1 (0.5–3.0)	1.9 (1.1–2.8)	2.3 (1.1–3.0)	2.4 (0.8–3.5)
Mean column velocity (ft/s)	0.0 (0.0–0.1)	0.0 (0.0–0.3)	0.3 (0.0–1.2)	0.1 (0.0–0.7)
15-cm column velocity (ft/s)	0.0 (0.0–0.1)	0.0 (0.0–0.2)	0.2 (0.0–1.0)	0.0 (0.0–0.5)
Water quality				
Water temperature (°C)	24.1 (23.4–24.7)	24.3 (23.3–25.3)	24.4 (23.5–25.5)	23.9 (23.7–24.7)
DO (mg/L)	6.2 (3.4–9.0)	7.1 (3.5–10.7)	8.1 (6.4–8.9)	8.1 (7.6–8.6)
DO % saturation	73.9 (41.1–107.9)	84.7 (41.2–130.9)	97.0 (75.4–106.8)	96.7 (90.4–101.7)
pH	8.3 (7.7–8.8)	8.2 (7.8–8.5)	8.4 (8.2–8.4)	8.5 (8.3–8.5)
Specific conductance (µs/cm)	580 (570–588)	582 (544–588)	580 (579–584)	581 (580–584)

[1]Denotes ornate vegetation taxa with complex leaf structure
[2]Denotes long broad or ribbon-like, austere-leaved vegetation taxa

Table 4. Summary of vegetation types sampled among reaches during 2024 random-station surveys in the Comal Springs/River and the percent occurrence of Fountain Darters in each vegetation type and reach. Raw numbers represent the sum of detections per reach-vegetation type combination and '-' denotes that the vegetation type was not sampled.

Vegetation Type	USR	LL	OC	NC	Total	Total Samples	Occurrence (%)
Bryophyte[1]	-	-	13	-	**13**	**21**	**61.9**
Cabomba[1]	0	7	-	6	**13**	**27**	**48.1**
Chara[1]	1	-	-	-	**1**	**5**	**20.0**
Filamentous algae[1]	1	2	4	0	**7**	**12**	**58.3**
Hygrophila[1]	-	-	0	-	**0**	**2**	**0.0**
Ludwigia[1]	-	3	26	-	**29**	**49**	**59.2**
Nuphar[2]	-	-	1	-	**1**	**7**	**14.3**
Sagittaria[2]	1	10	-	-	**11**	**38**	**28.9**
Vallisneria[2]	-	21	-	-	**21**	**39**	**53.8**
Total	**3**	**43**	**44**	**6**	**96**	**200**	**48**
Total samples	**20**	**80**	**80**	**20**	**-**	**-**	**-**
Occurrence (%)	**15.0**	**53.8**	**55.0**	**30.0**	**-**	**-**	**-**

[1]Denotes ornate vegetation taxa with complex filamentous or leaf structure
[2]Denotes long broad or ribbon-like, austere-leaved vegetation taxa

Population Demography

Seasonal population trends

Median Fountain Darter density in 2024 was higher in the spring (2.50 darters/m^2; includes routine and June Critical Period sampling) compared to fall (0.00 darters/m^2). Upper quartile density, and thus, variation in density (i.e., interquartile range), were also higher in spring (14.00 darters/m^2) compared to fall (2.00 darters/m^2) (Figure 9A). Timed and random dip-netting illustrated similar seasonal trends in 2024. Median CPUE and occurrence were greater in spring (64 darters/p-h and 63%, respectively), decreased in summer (11 darters/p-h and 20%, respectively), and increased in fall (28 darters/p-h and 33%) to index levels that were still below results from spring (Figure 9B, 9C). Across indices, patterns observed in spring represented the only season that approximated 5-year and long-term trends, though median index values were still lower than historical medians. Lower median index values for spring are likely due to the inclusion of the June Critical Period sampling event which occurred from June 11th - 17th, prior to the summer solstice on June 20th (see sections below for further discussion). Median index values in summer and fall were approximately equal to or less than 5-year and long-term lower quartiles (Figure 9).

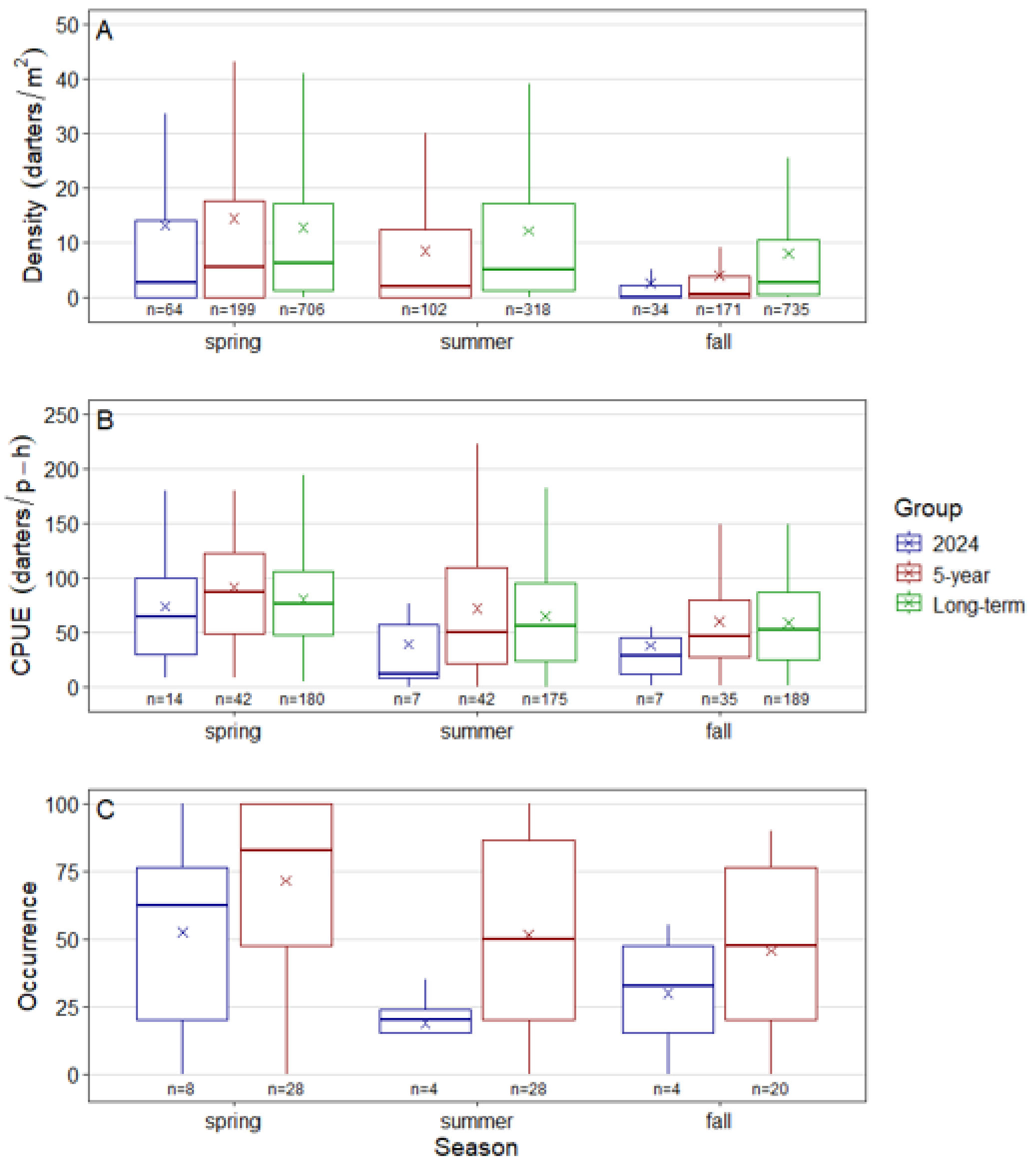

Figure 9. **Boxplots comparing Fountain Darter density from drop-net sampling (A), catch-per-unit-effort (CPUE) from timed dip-netting (B), and percent occurrence from random-station dip-netting (C) among seasons in the Comal Springs/River. Temporal groups include 2024, 5-year (2020–2024), and long-term (2001–2024) observations. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range. The "n" values along the x-axes represent the number of samples per category.**

Ubiquitous declines across indices in summer and fall suggest that the prolonged period of extremely reduced flows have resulted in a decline in population condition. That said, these patterns are not uniform across the system and other results in this report illustrate that population condition varied spatially both within and among sampling events.

Drop-net sampling density trends

Temporal trends in Fountain Darter density from 2020–2024 varied across reaches. Median densities over time were not strongly correlated ($r < 0.7$) between reaches, suggesting spatially variable dynamics the past five years. At Upper Spring Run, median density from 2020–2023 was most frequently 0.00 darters/m^2. Samples above the long-term median (1.00 darters/m^2) were rare and median density only exceeded this threshold in spring 2022 (3.75 darters/m^2). In 2024, median density at Upper Spring Run increased above its long-term median in April (2.50 darters/m^2) but then declined back to 0.00 darters/m^2 by fall. Density trends at Landa Lake over the past five years showed no strong directionality and instead illustrated regular seasonal cycles. Median density typically increased above Landa Lake's long-term median (2.50 darters/m^2) in spring and decreased below this threshold by fall. Interestingly, median densities that were above the long-term expectation in spring were followed by decreases 8–24 times lower in the subsequent fall, as demonstrated in 2024 (20.00 to 2.50 darters/m^2). Median density in spring 2022 (7.25 darters/m^2) was the only seasonal event below its long-term median and was followed by a minimal decrease the next fall (6.25 darters/m^2) (Figure 10).

Density trends at Old Channel also displayed regular seasonal cycles with higher densities in spring and lower densities in summer and fall. In contrast to Landa Lake, median density displayed a declining trend from 2020–2024. During this time, median density generally decreased from 16.75 to 5.50 darters/m^2 during sampling events in spring and decreased from 4.75 to 1.25 darters/m^2 in the fall. Despite this notable downward trend, median density from 2023–2024 still approximated Old Channel's long-term median (3.50 darters/m^2), except in fall 2024 (1.25 darters/m^2). Density trends at New Channel displayed the greatest deviations from historical expectations compared to other reaches. Median density showed minimal directionality from 2020–2022 (0.00–3.75 darters/m^2). Changes in upper quartiles showed seasonality and were higher in spring (3.50–11.13 darters/m^2) compared to fall (0.13–2.13 darters/m^2). Median density substantially increased in spring 2023 (23.50 darters/m^2), which was 12 times higher than the long-term median (2.00 darters/m^2). Median density then decreased, but remained higher than the long-term upper quartile by fall 2023 (8.00 darters/m^2). In 2024, density continued to decrease throughout the year and zero Fountain Darters were collected in this reach in the fall (Figure 10).

Across all reaches, median densities in April 2024 were above the long-term median, while median densities in June were below or approximated long-term medians (Figure 10). This suggests that inclusion of the June Critical Period event in the spring season likely contributed to lower overall spring median density compared to 5-year and long-term values (Figure 9).General reach-level differences in temporal patterns can likely be best explained by dissimilarities in habitat stability. Discontinuous trends observed at Upper Spring Run was probably a result of greater variability in environmental conditions relative to other reaches. In 2023, for example, decreases in bryophyte coverage at Upper Spring Run were associated with springflow declining to 0 cfs, and median Foutain Darter density consequently was zero. Median density increased in spring 2024 when both springflow and bryophyte coverage increased, but declined to zero again as both environmental parameters also fell to zero. In contrast to Upper Spring Run, temporal patterns at Landa Lake and Old Channel illustrated more regular seasonal oscillations. Population cycles are a more common phenomenon in stable environments, with changes in abundance typically driven by timing of reproduction (Berryman 2002). Moreover, changes in density from spring to fall occurred at much greater magnitudes at Landa Lake compared to Old Channel, particularly after spring densities greatly exceeded long-term values. While substantial declines in fall 2023 and 2024 can be partially explained by decreases of bryophytes due to low flows, the consistency of these large seasonal changes suggests this reach is characterized by over-compensatory dynamics (Rose et al. 2001). Under this dynamics scenario, recruitment rates at low densities greatly exceeds carrying capacity, subsequently resulting in intense competitive population regulation over a short time frame (Berryman 2002, Shoemaker et al. 2020).

Fountain Darter median density in the Old Channel was well above long-term values from spring 2020 to summer 2022 due to habitat restoration in this reach which has replaced *Hygrophila* with bryophytes. However, patterns in Fountain Darter density at Old Channel have shown a downward trend recently and are likely due to changes in coverages *Cabomba*, which has largely been absent in the reach since 2023. Additionally, as mentioned previously, flows at Old Channel study reach dropped to zero for ~22 hours on October 22nd this year, approximately one-week before drop-net sampling. Fall 2024 densities were the lowest since 2020 and potentially influenced by this zero-flow anomaly.

Lastly, abrupt increases in density at New Channel in 2023 were surprising, but can again be explained by the influence of flow on habitat conditions. Recruit densities were high in 2023, resulting from expansion of more suitable vegetation (e.g., bryophytes, *Hygrophila*) due to flow stability (Katz and Freeman 2015). However, any potential positive effect was brief and densities declined to zero by fall 2024 as flows continued to decline, bryophytes disappeared, and filamentous algae increased. As with the Old Channel, zero-flow anomalies also occurred at the New Channel this fall. Based on USGS gage # 08168932, the continuous duration of zero-flow was less than Old Channel, though the number of days where it occurred was greater (n = 7 days; USGS 2024).

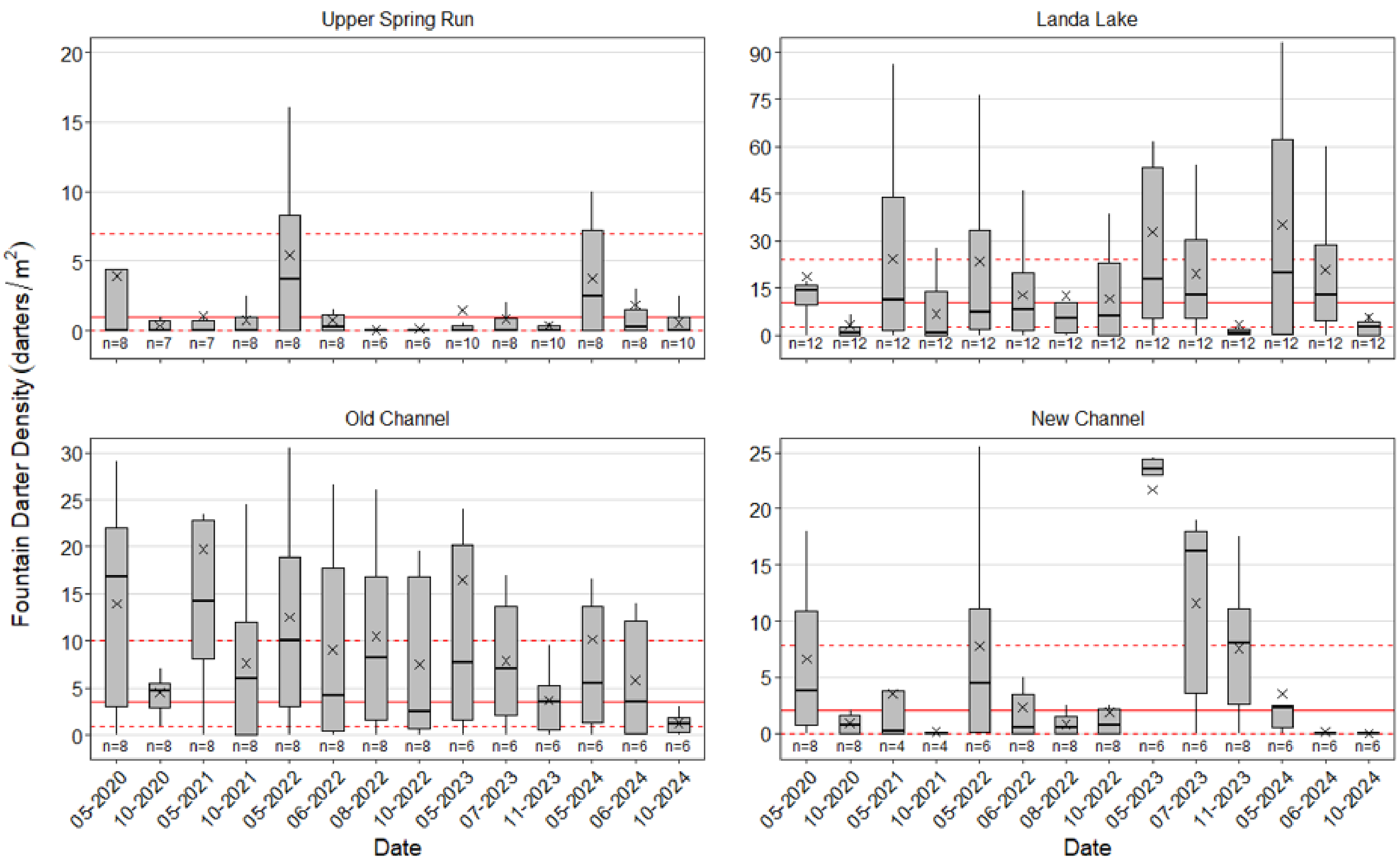

Figure 10. **Boxplots displaying temporal trends in Fountain Darter density (darters/m²) among study reaches from 2020–2024 during drop-net sampling in the Comal Springs/River. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range. The "n" values along the x-axes represent the number of drop-net samples in each category. Solid and dashed red lines denote long-term (2001–2024) medians and interquartile ranges, respectively.**

Size structure and recruitment trends

Seasonal differences in size structure and recruitment remained mostly consistent from 2020–2024, as demonstrated by lower median lengths and higher recruitment rates in spring (19–25 mm and 19.0–60.4%, respectively) compared to summer (24–26 mm and 17.8–35.5%, respectively) and fall (23–27 mm and 18.1–45.2%, respectively). Violin plots also illustrated a greater proportion of smaller darters in spring relative to other seasons. That said, five-year trends in Fountain Darter recruitment deviated from long-term expectations during 1–3 sampling events per season. Recruitment in spring approximated or exceeded the long-term mean (48.3%) from 2020–2023 (48.5–60.4%), but was lower than expected in April (40.2%) and June (19.0%) of 2024. Summer recruitment approximated long-term expectations (22.4%) all years except 2021, when it was higher (35.5%). Recruitment in fall greatly exceeded the long-term mean (19.5%) in 2022 (45.2%) and 2024 (38.4%) (Figure 11).

Lower than expected spring recruitment in June was not surprising given that this was a low-flow Critical Period event and is not within the window of peak reproduction (Schenk and Whiteside 1977). However, results from April indicated that spring recruitment rates were reduced in 2024. Drop-net and timed dip-net data from April sampling illustrated that ~70% of recent recruits were observed at Landa Lake and the remaining study areas contributed ≤ ~10% to overall recruitment. This suggests impacts to reproductive output were greatest at Upper Spring Run, where springflows went to zero, and at the Old and New Channels which are farther from spring outputs. The large increase in recruitment that occurred in fall 2024 was also mostly due to output at Landa Lake (~74%), followed by Upper Spring Run (~13%) and Old Channel (~10%). It was previously suggested that stable and/or low flows increases young-of-year survival (BIO-WEST 2023a; BIO-WEST 2024a), which other fisheries studies observed and suggested as a potential resistance mechanism against reduced flows (McCargo and Peterson 2010, Katz and Freeman 2015). Results from April 2024 demonstrated suppressed recruitment of Fountain Darters throughout the system during the peak reproductive period, with the exception of Landa Lake. This indicates that environmental conditions have degraded in riverine and upper spring habitats (e.g., increased coverage of filamentous algae) as extreme low-flow conditions persisted, which also likely relates to the lower population condition observed by fall 2024.

Water temperature is also considered a limiting factor on Fountain Darter egg and larval production. Exceedance of optimal temperature thresholds from previous laboratory studies likely explains some of the recruitment patterns observed in 2024, particularly in April. Egg and larval production thresholds were exceeded within riverine habitats and upper spring habitats from spring to fall, but was never exceeded at Landa Lake. Based on this, impacts observed in fall may have been the result of cumulative effects of increased water temperatures since the spring (Shreck 2000). Impacts at reaches in upper spring and riverine habitats may instead have resulted in a negative synergistic effect by the combination of increased temperatures, reduced flow, and decreased coverage of suitable vegetation (Matthaei and Lange 2016). That said, recruits were observed during fall sampling at Upper Spring Run, which occurred when water temperatures began to exceed these production thresholds less frequently. This illustrates that recruitment can still occur in more heavily impacted habitats when suitable environmental conditions return, suggesting population resiliency.

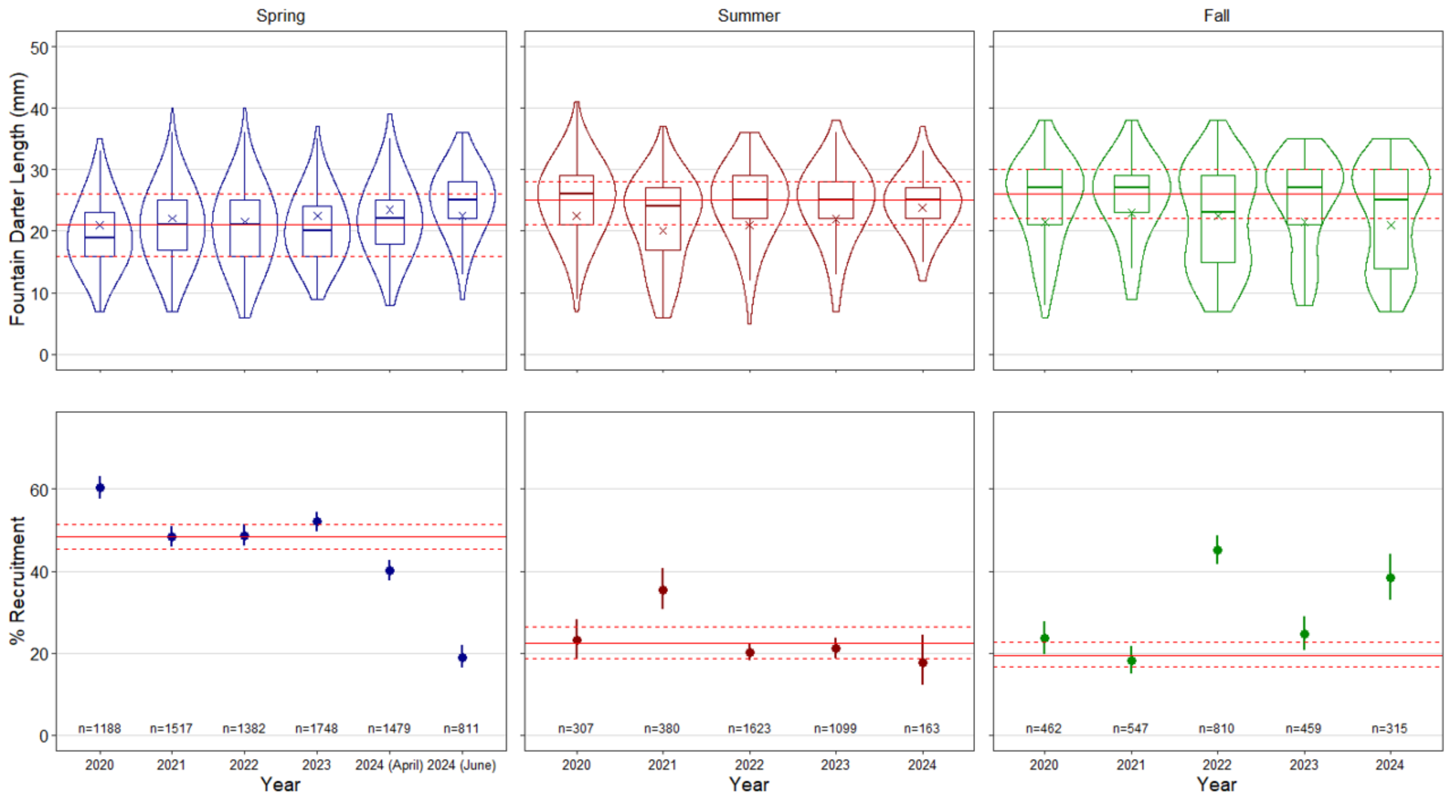

Figure 11. **Seasonal trends of Fountain Darter size structure (mm; top row) and percent recruitment (bottom row) in the Comal River from 2020–2024. Spring and fall trends are based on drop-net and timed dip-net data in aggregate, whereas summer trends are based on timed dip-net data only. Size structure is displayed with boxplots (median, quartiles, range) and violin plots (probability density; polygons outlining boxplots). The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range. The "n" values along the x-axis of the top row represent the number of Fountain Darter length measurements in each distribution. Recruitment is the percent relative abundance (± 95% CI) of darters ≤20 mm. Long-term (2001–2024) trends in size structure are represented by median (solid red line) and interquartile range (dashed red lines). Recruitment is compared to the long-term mean percentage (solid red line) and 95% CI (dashed red lines).**

Habitat Use and Suitability

Density trends among vegetation taxa

Median densities in 2024 were highest in bryophytes (9.25 darters/m^2), *Vallisneria* (7.75 darters/m^2), and *Ludwigia* (5.50 darters/m^2). Median estimates were lower in *Cabomba* (2.25 darters/m^2), *Chara* (2.00 darters/m^2), and *Hygrophila* (0.50 darters/m^2), and were 0.00 darters/m^2 in *Sagittaria* or open habitats. Fountain Darter densities in *Vallisneria* were greater than historical medians in 2024. In contrast, *Cabomba* and *Hygrophila* densities were lower than historical expectations. Densities in bryophytes closely approximated 5-year trends in 2024, but both median estimates were below the long-term median. The remaining taxa and open habitats aligned with historical expectations, although densities in *Ludwigia* were extremely variable and exceeded 50 darters/m^2 at multiple samples in Landa Lake (Figure 12).

Greater densities within ornate taxa aligned with expectations based on historical data and past research on Fountain Darter habitat associations (Schenck and Whiteside 1976, Linam et al. 1993, Alexander and Phillips 2012, Edwards and Bonner 2022). Similar to 2023, higher than typical densities in *Ludwigia* and *Vallisneria* were directly related to greater prevalence of bryophytes within, creating greater complexity in physical structure that is more suitable for darters (Alexander and Phillips 2012, Edwards and Bonner 2022). Lower densities in *Cabomba* and *Hygrophila* this year was mainly attributed to reach-level differences in current environmental conditions. For example, median density in *Cabomba* was ~20 darters/m^2 at Landa Lake and 0 darters/m^2 at Upper Spring Run and New Channel. As mentioned previously, both Upper Spring Run and New Channel experienced zero-flow conditions in 2024 and elevated water temperatures, which likely best explains these observed spatial differences. Similarly, bryophyte densities the past five years have been lower than expected, which can be explained by the general decreasing trend in coverage of this taxon and the increasing amount of filamentous algae which is often intermixed with bryophytes.

Size structure among vegetation taxa

Boxplot summary statistics and violin plots showed that Fountain Darter size structure varied among vegetation taxa sampled in 2024. The lowest median lengths occurred in open (19 mm), *Cabomba* (22 mm), and *Ludwigia* (22 mm), were intermediate in *Vallisneria* (23 mm) and bryophytes (25 mm), and highest in *Chara* (28 mm), *Sagittaria* (29 mm), and *Hygrophila* (29 mm). Size structure distributions for *Cabomba* suggest it was important habitat for recent recruits. Bryophyte size patterns were left-skewed, though the importance of this habitat for juvenile darters is clear, based on darters <15 mm being relatively frequent. Approximately symmetric length distributions for *Ludwigia* and *Vallisneria* illustrated these taxa were important habitat across life stages in 2024. Distributional patterns for the remaining taxa were left-skewed, suggesting they mainly provided habitat for adults. A greater proportion of younger darters were observed in *Ludwigia* and *Vallisneria* compared to 2023, further demonstrating that increased bryophyte coverage within macrophytes provides complex habitat suitable for juveniles (Figure 13) (Edwards and Bonner 2022; BIO-WEST 2024).

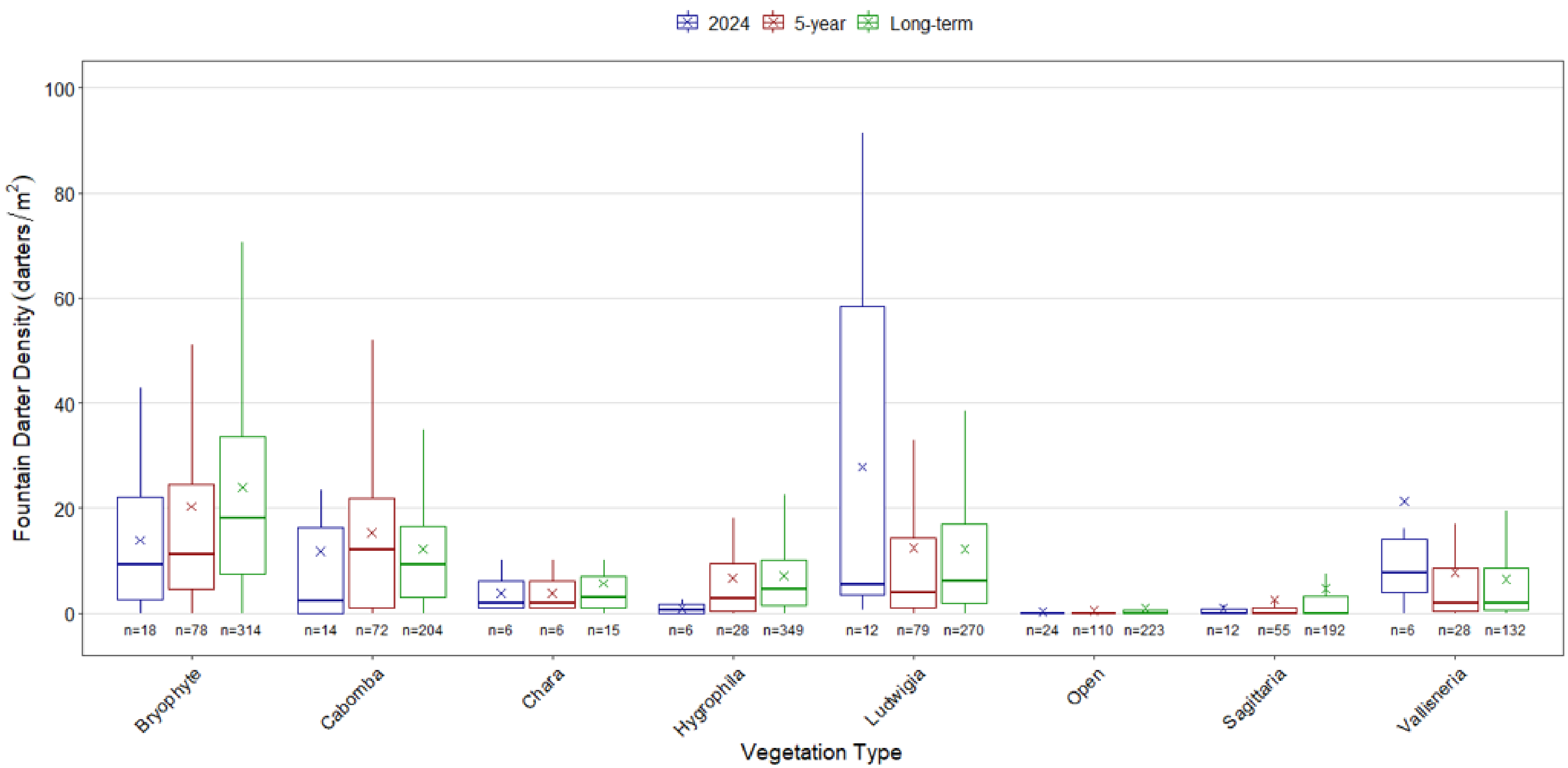

Figure 12. **Boxplots displaying 2024, 5-year (2020–2024), and long-term (2001–2024) drop-net Fountain Darter density (darters/m^2) among vegetation types in the Comal Springs/River. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range. The "n" values along the x-axes represent drop-net sample sizes per group.**

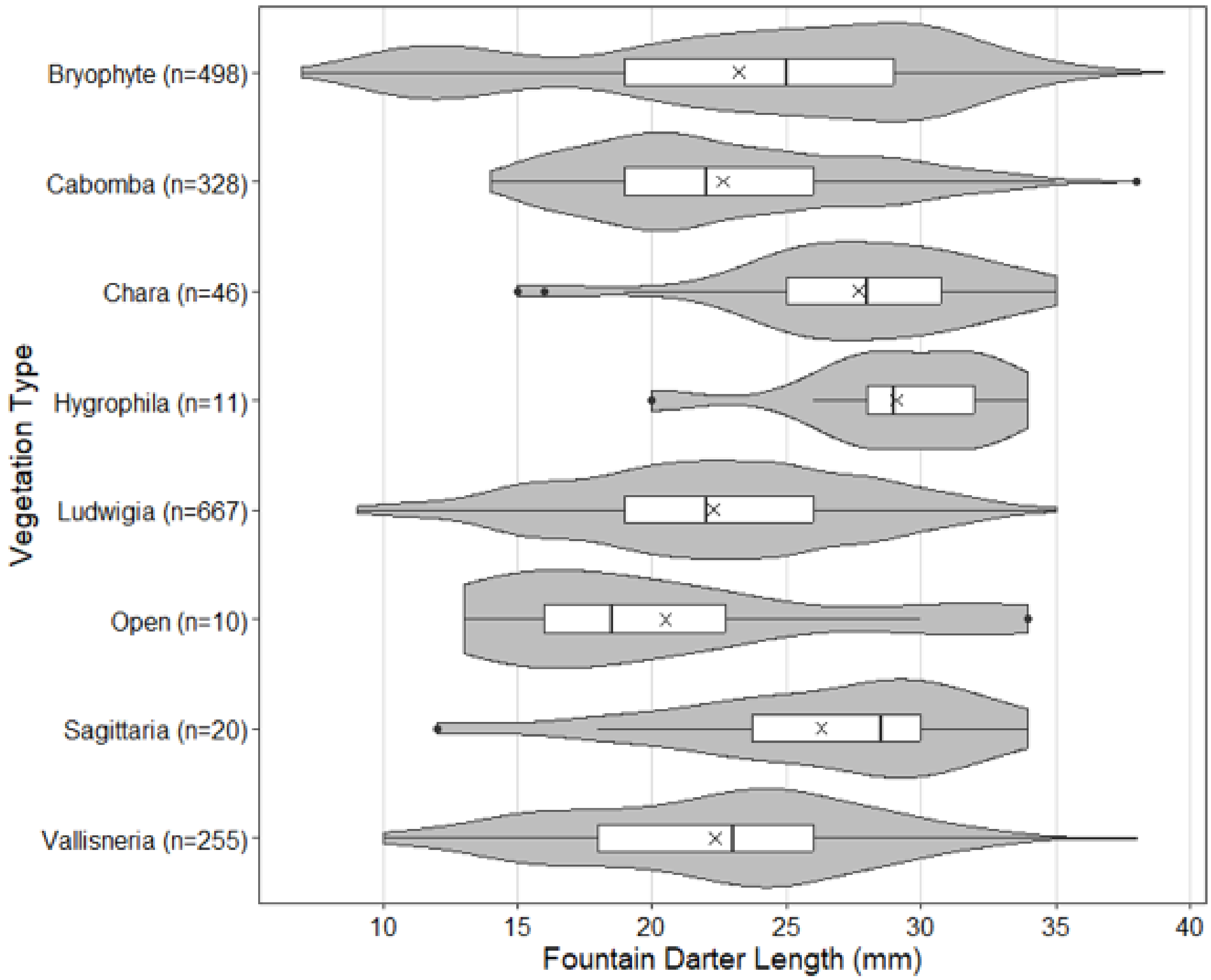

Figure 13. **Boxplots and violin plots (grey polygons) displaying Fountain Darter lengths among dominant vegetation types during 2024 drop-net sampling in the Comal Springs/River. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range, and outliers beyond this are designated with solid black circles. The "n" values represent the number of Fountain Darter length measurements per vegetation type.**

Habitat suitability

Temporal trends in the Fountain Darter Overall Habitat Suitability Index (OHSI) from 2020–2024 varied among reaches. Patterns in OHSI estimates were not strongly correlated ($r < 0.7$) between reaches, except for Landa Lake and Upper New Channel, which demonstrated a moderate negative correlation ($r = -0.6$). This indicates spatial variability in habitat conditions the past five years. OHSI patterns at Upper Spring Run and both New Channel reaches displayed more variation compared to other reaches, demonstrating more regular seasonal cycles. Upper Spring Run and Lower New Channel showed no strong directionality in OHSI trends, while Upper New Channel increased moderately the past five years. OHSI at Landa Lake and Old Channel have decreased over time, with distinct shifts to lower, but relatively stable OHSI trends starting in 2022 and 2023. For most of the time-series, OHSI estimates were generally within the bounds of long-term 95% confidence intervals in all reaches except Landa Lake, which have mostly fallen below this threshold since 2023. That said, OHSI confidence intervals at Landa Lake during this time did overlap with the long-term, emphasizing that there is some uncertainty regarding whether these values differ from long-term expectations (Figure 14).

Variable trends in OHSI observed the past five years can be explained by differences in the strength of associations between vegetation coverage and OHSI between reaches. Changes in OHSI at Upper Spring Run were most related to coverage of filamentous algae. OHSI at Landa Lake was most influenced by the two most dominant taxa (*Vallisneria* and *Sagittaria*) and by bryophytes. Habitat suitability at Old Channel and both New Channel reaches were strongly associated with changes in coverage of *Cabomba*. In addition, Old Channel and Upper New Channel OHSIs were also influenced by changes in *Ludwigia* and *Hygrophila* coverages, respectively. Although increases in intermixed bryophytes resulted in increased Fountain Darter densities in 2023 and 2024, this is not captured by the OHSI which assigns long-term taxa-specific suitability criteria based on dominant vegetation. For example, a patch of *Vallisneria* with intermixed bryophytes (and thus high Fountain Darter density as seen at Landa Lake) would be assigned the long-term *Vallisneria* suitability criteria (0.46 ± 0.07) for OHSI calculations. As a result, the current OHSI framework does not accurately reflect the increased habitat structure at these microhabitat spatial resolutions. Therefore, habitat suitability may be higher than shown by OHSI estimates at Landa Lake this year. Similarly, increased OHSI at Upper Spring Run was due to increased filamentous algae coverage. However, based on Fountain Darter population condition being low in this reach in 2024, long-term suitability values for filamentous algae may not accurately reflect current habitat suitability in this reach, and OHSI may overestimate habitat condition at Upper Spring Run. Conversely, there may be other factors such as water temperature influencing Fountain Darter population in this reach more than habitat.

In summary, observed trends in habitat suitability help partially explain the positive and negative population responses of Fountain Darters in the Comal system. Future assessments may benefit from incorporating other relevant habitat factors to provide more complete realizations of habitat suitability. Increasing model complexity for OHSI estimates by incorporating other environmental factors as Habitat Suitability Criteria could provide better realizations of spatial variation in habitat suitability, both within and among reaches.

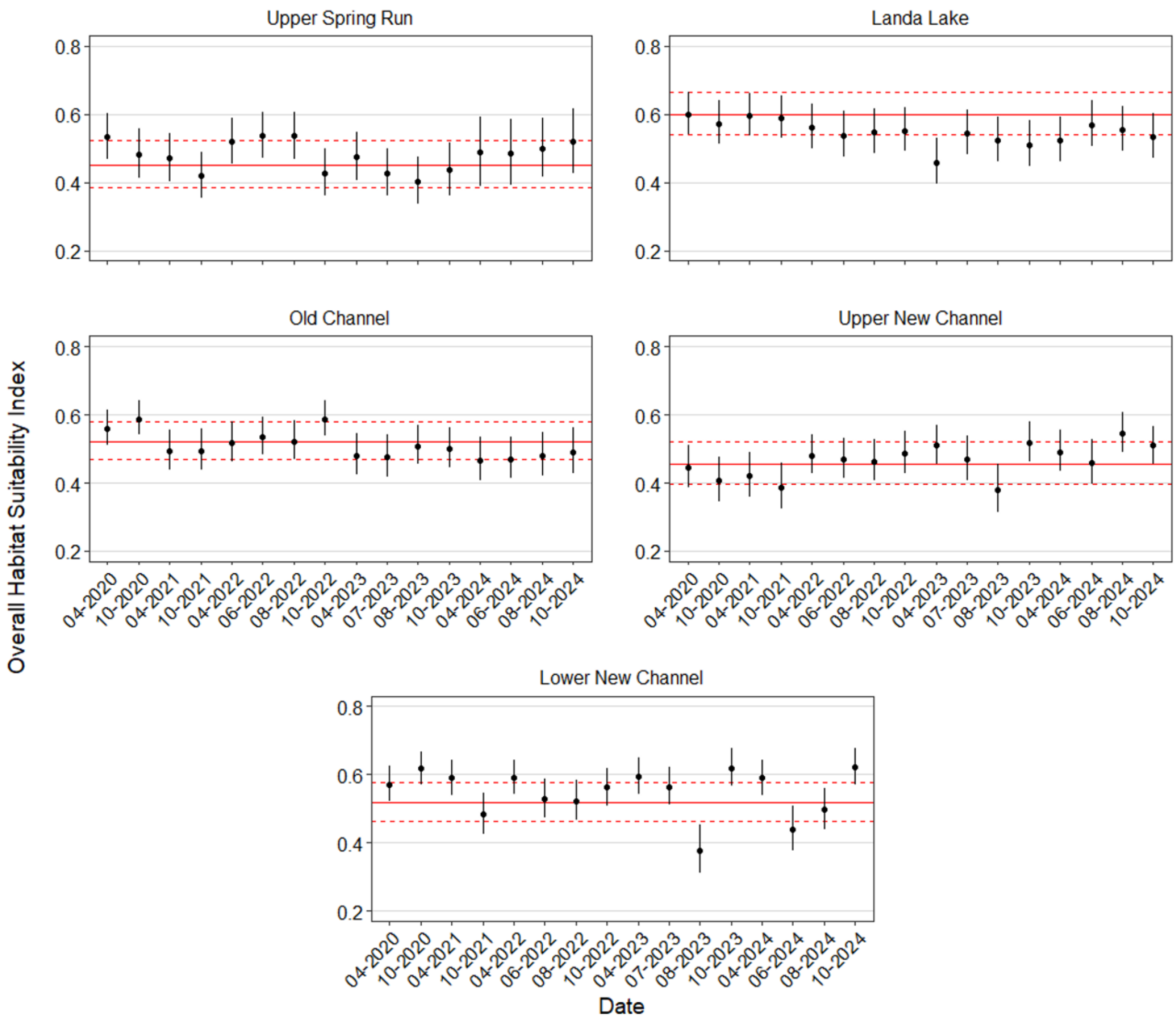

Figure 14. **Overall Habitat Suitability Index (OHSI) (±95% CI) from 2020–2024 among study reaches in the Comal Springs/River. Solid and dashed red lines denote means of long-term (2003–2024) OHSI and 95% CI, respectively.**

Fish Community

In 2024, a total of 14,252 fishes represented by seven families and 25 unique species were observed in the Comal Springs/River System. Complete summaries of segment-level community composition can be found in Appendix E. Fish assemblage structure (percent relative abundance) varied from spring-influenced to riverine areas. Guadalupe Roundnose Minnow (*Dionda nigrotaeniata*) was the dominant species in upstream spring-associated reaches including Upper Spring Run (57.2%) and Landa Lake (57.1%) (Appendix E, Table E2). Other spring-associated species dominated the assemblages at these two reaches, including the Fountain Darter which was the third most abundant species at Landa Lake (5.1%) and fourth most abundant species in Upper Spring Run (6.0%). Texas Tetra (*Astyanax argentatus*) was a dominant species in both spring and riverine areas as it was the most abundant species at Old Channel (24.0%) and second most abundant species at Landa Lake (23.1%) and New Channel (16.1%) (Appendix E, Table E2).

Temporal trends in fish communities varied between and within study segments. In general, species richness and diversity were higher in riverine areas (i.e., Old Channel and New Channel) and lowest at Landa Lake, though both metrics varied from event to event and displayed no detectable temporal patterns (Figure 15). Species richness and diversity were intermediate at Upper Spring Run, yet both metrics were more similar to riverine segments than to spring segments. Diversity has generally increased at Landa Lake and Old Channel over the past five years when compared to entire monitoring period (2014-present), though it did vary for some events (Appendix E, Figure E16). Increases in diversity over the past five years could suggest that community composition in both reaches has become more heterogenous.

Temporal trends in richness of spring fishes aligned with community-level observations and were generally stable throughout the study area. Spring fishes' richness ranged from 4–6 species across all segments, generally not changing by more than one species from one event to the next. Relative density of spring fishes at Landa Lake was higher and more consistent than at Upper Spring Run, Old Channel, or New Channel. However, relative density at Old Channel has been more stable since 2023 and generally higher than the previous three years (Figure 16). In contrast, relative density of spring fishes has varied more at New Channel over the course of 2024. Relative density declined sharply between fall 2023 (83.3%) and April 2024 (43.0%) and between June 2024 (70.6%) and fall 2024 (23.0%), which was the lowest observed over the monitoring period (Figure 16 and Appendix E, Figure E17).

Temporal trends in Fountain Darter density from 2020–2024 were based on microhabitat sampling data. Median density increased from spring to fall at Upper Spring Run and Old Channel (Figure 17). At Landa Lake, median density fluctuated slightly below the long-term median in April and October and above in June. At New Channel, median densities were higher in April 2024 then decreased in June. By fall sampling, densities increased near the long-term median (Figure 17). Historically, trends in microhabitat sampling were similar to Fountain Darter densities from drop-net sampling in which higher densities generally occurred in the spring and lower densities generally occurred in the fall. However, microhabitat densities in 2024 approximated long-term medians in the fall, with some reaches increasing from spring to fall. In contrast, drop-net densities in all reaches declined well below long-term medians. These patterns together could suggest that Fountain Darters sought refuge in deeper water and highlight the importance of multiple sampling methodologies.

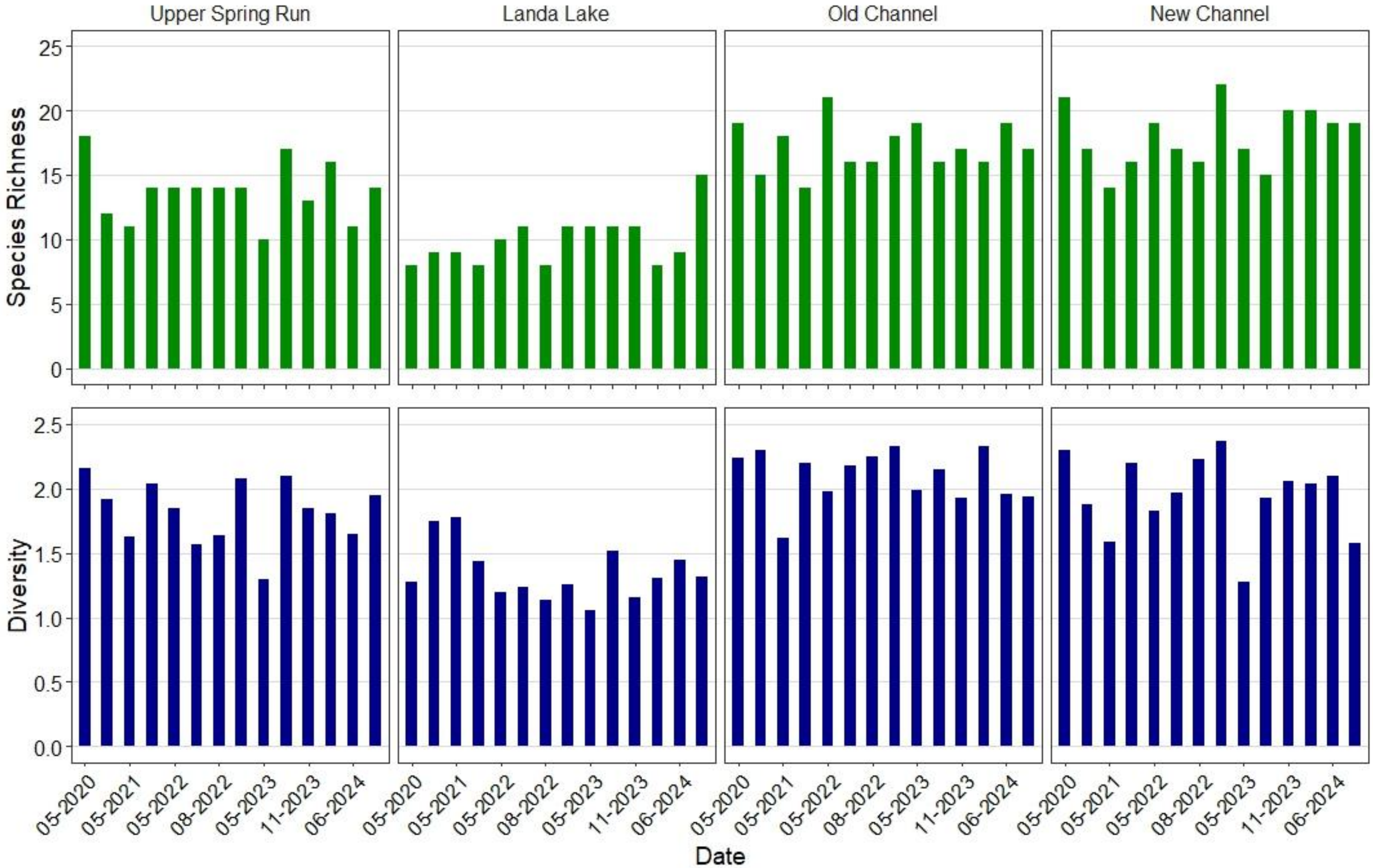

Figure 15. **Bar graphs displaying species richness (top row) and diversity (bottom row) from 2020–2024 based on all three fish community sampling methods in the Comal Springs/River.**

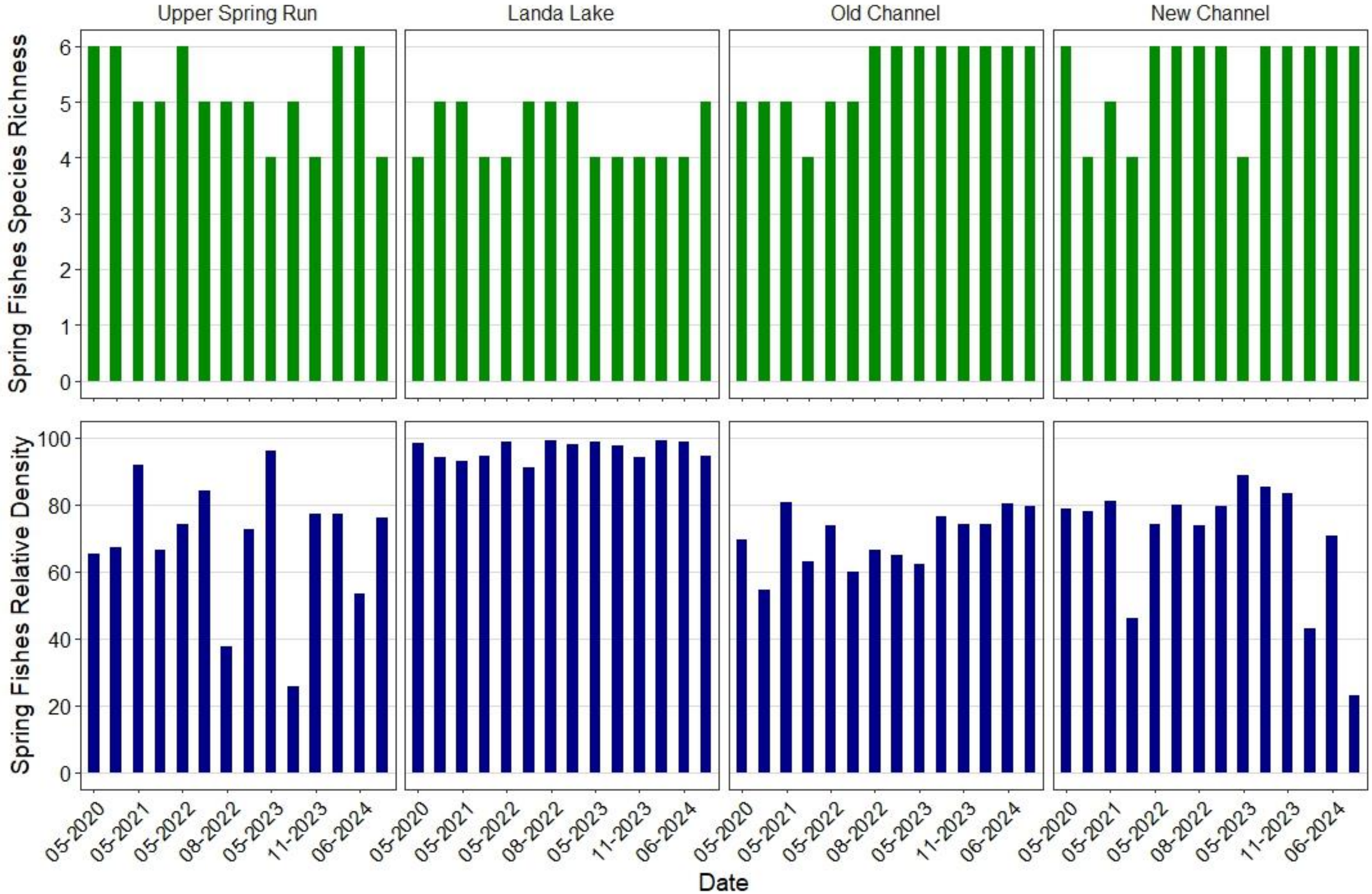

Figure 16. **Bar graphs displaying spring fish richness (top row) and relative density (RD; %) (bottom row) from 2020–2024 based on all three fish community sampling methods in the upper Comal Springs/River.**

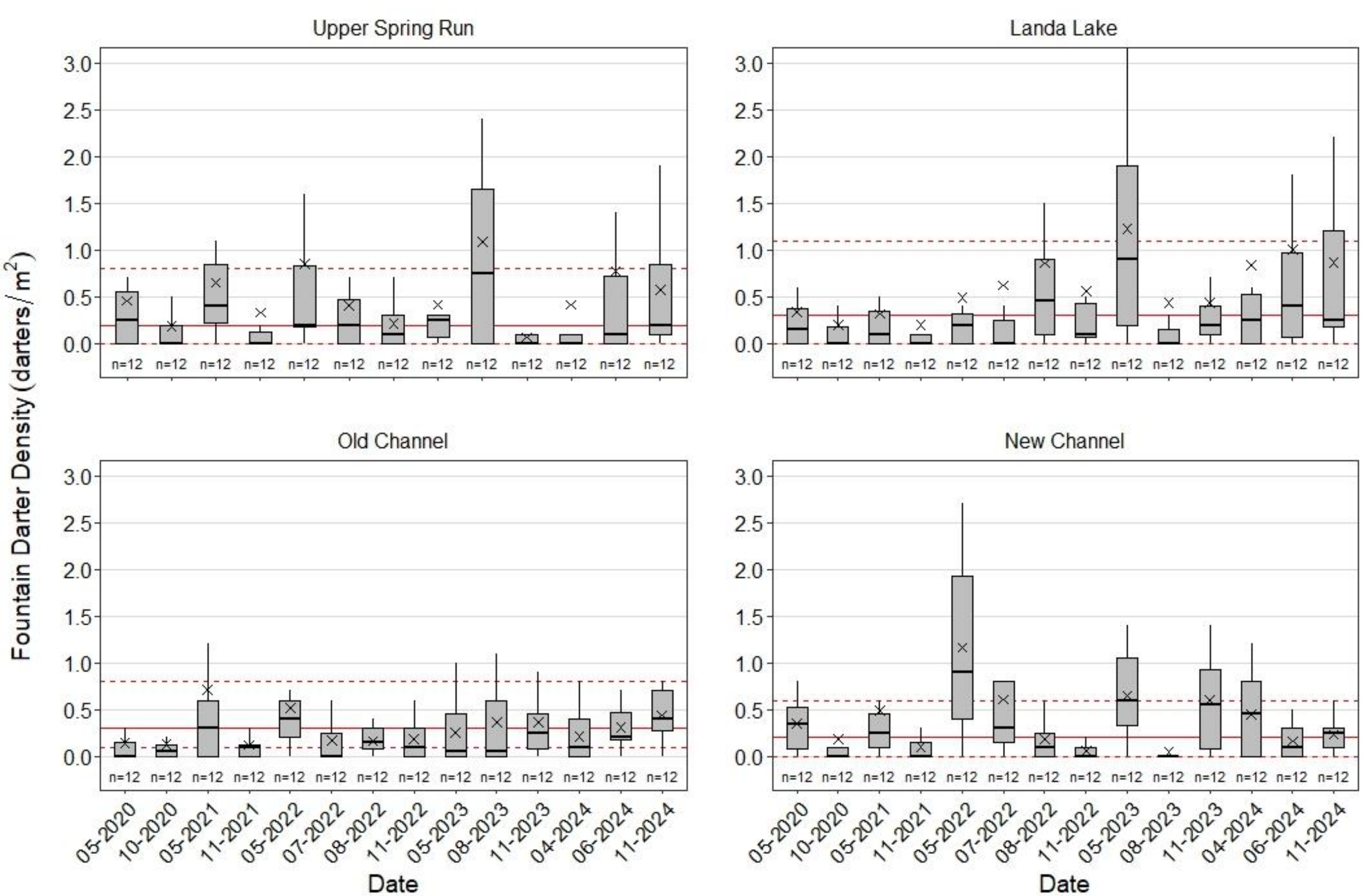

Figure 17. **Boxplots displaying temporal trends in Fountain Darter density (darters/m^2) among study reaches from 2020–2024 during fish community microhabitat sampling in the Comal Springs/River. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range. The "n" values along the x-axes represent the number of microhabitat samples per category. Solid and dashed red lines denote long-term (2014–2023) medians and interquartile ranges, respectively.**

Comal Springs Salamander

Low springflows in 2024 resulted in substantial reductions to surface salamander habitat similar to 2023. A total of 56 Comal Springs Salamanders were observed during three survey efforts. Sampling was not conducted at Spring Island Run and Spring Run 1 during the June Critical Period and fall events because these sites were completely desiccated. A third consecutive year of ongoing drought with reduced springflow and desiccated conditions resulted in lower than average counts in 2024 across all sites except at Spring Island Outfall during April and June when counts overlapped with long-term averages (Figure 18). Flows were lowest during fall sampling and resulted in larger reduction in wetted habitat (e.g., 50% at Spring Island Outfall) than in previous years, contributing to lower salamander numbers at Spring Island Outfall and Spring Run 3.

Five-year trends at Spring Island Run did not display any distinct patterns in CPUE and generally varied about 1 to 3 salamanders/p-h until this run dried up in summer 2023 (Figure 19). Although salamanders were observed in spring 2024 after several months of desiccated conditions, catch rates were lower than previous years. Spring Island Outfall has varied from 8 salamanders/p-h to over 40 salamanders/p-h between 2020 and 2024. Catch rates were consistently high from spring 2020 to spring 2022 but have been variable since that time. Despite sustained low flows throughout most of 2023 and 2024, catch rates in 2024 increased from spring to fall. At Spring Run 1, the lowest observed catch rates over the past five years occurred in spring 2024. Flows did not remain at Spring Run 1 long enough to see if typical catch rates would return. At Spring Run 3, salamander CPUE trends were generally above 20 salamanders/p-h until August 2023 when CPUE began decreasing. However, the catch rate of 48.57 salamanders/p-h in October 2023 was the second highest recorded over the past five years. This increase was temporary as catch rates decreased from spring through fall in 2024. Continued monitoring will provide further insight to how catch rates are affected following dry conditions during this low-flow year.

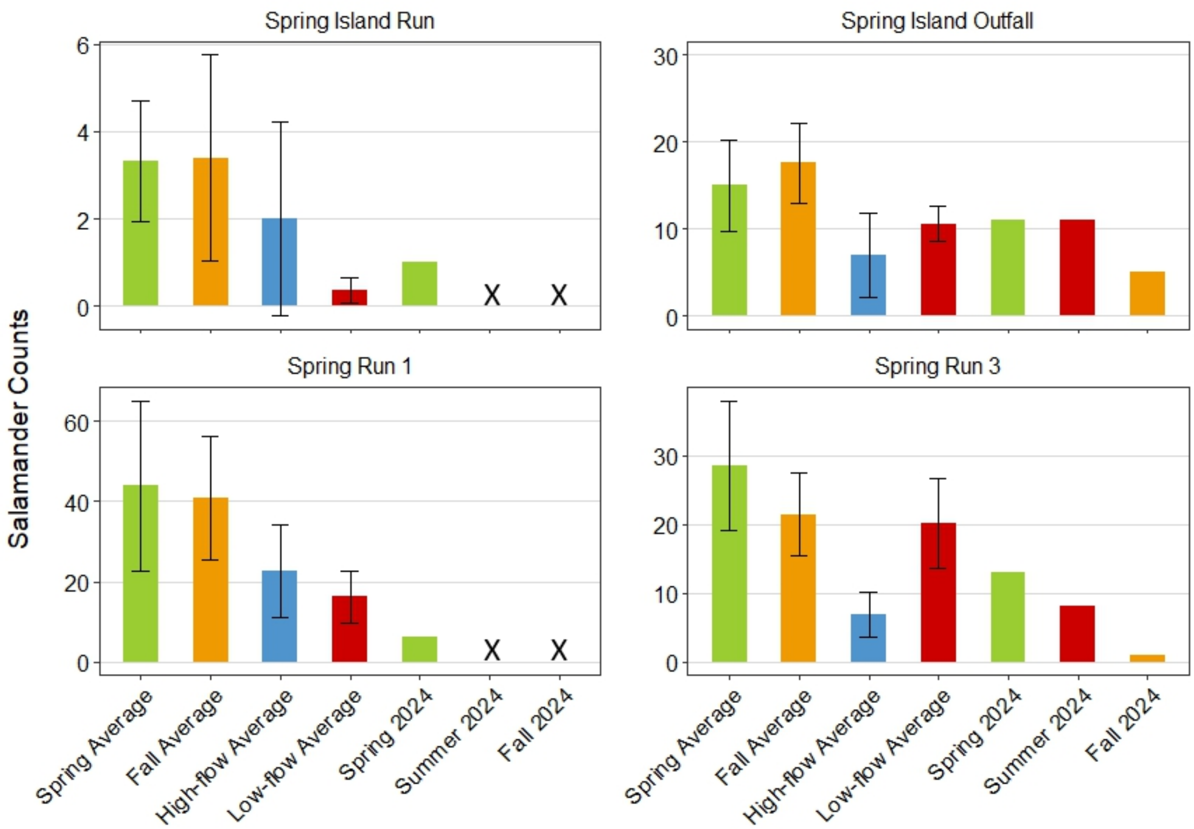

Figure 18. **Comal Springs Salamander counts among Comal Springs survey sites in 2024, with the long-term (2001–2024) average for each sampling event. Error bars for long-term averages represent 95% confidence intervals. X within dates at Spring Island Run and Spring Run 1 denotes lack of sampling due to dry conditions.**

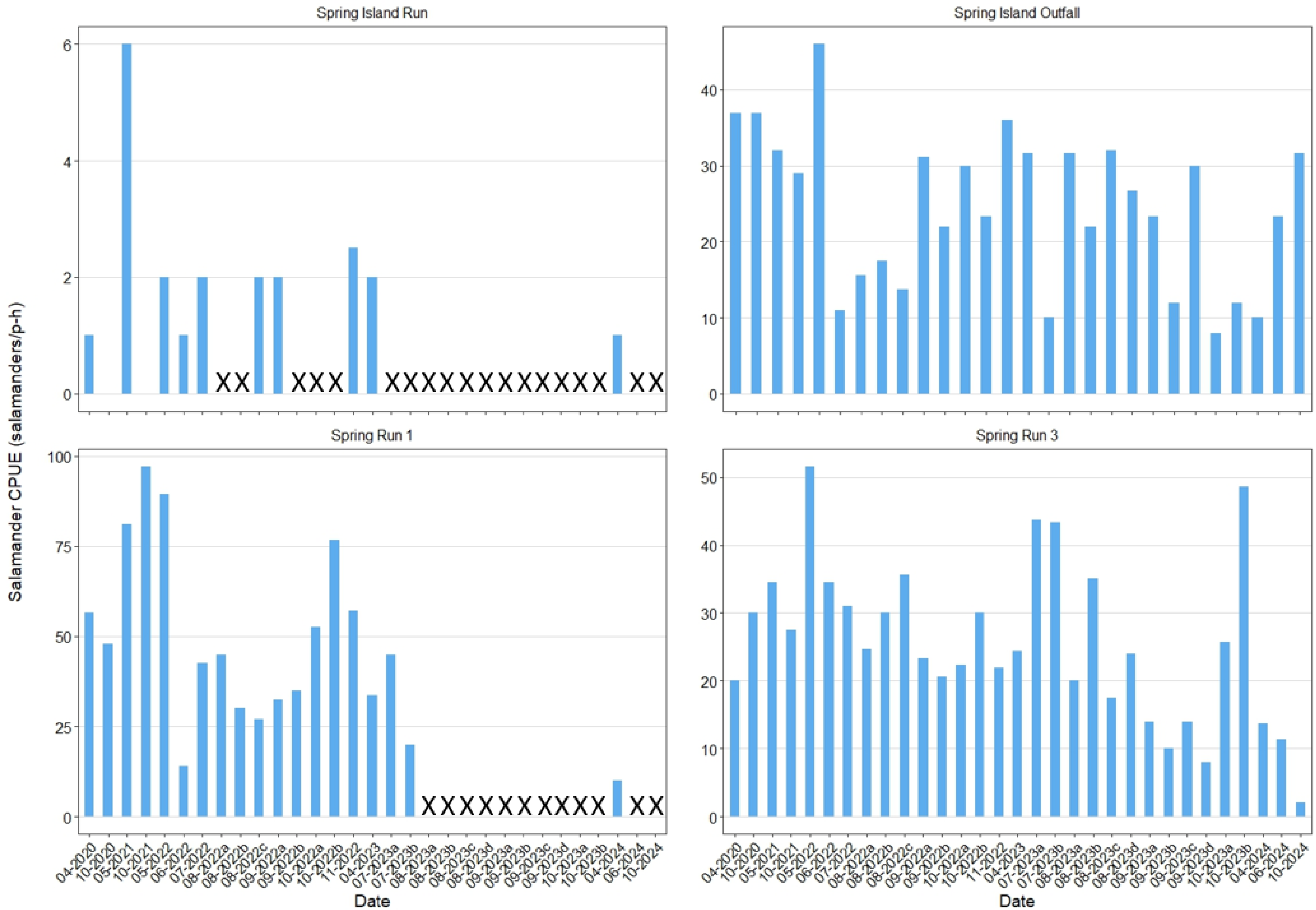

Figure 19. **Comal Springs Salamander catch-per-unit-effort (CPUE; salamanders/person-hr) among sites from 2020–2024 in the Comal Springs. No bar within dates at Spring Island Run denotes zero salamanders observed. X within dates at Spring Island Run and Spring Run 1 denotes lack of sampling due to dry conditions.**

Macroinvertebrates

Drift-Net Sampling

A total of 389 macroinvertebrates represented by 12 families and 22 taxa were collected during 144 drift-net hours. The total number of individuals collected was lower at Spring Run 1 (n = 29) than Spring Run 3 (n = 125) and Western Upwelling (n = 235). All three locations had fewer invertebrates than they have historically which can likely be attributed to reduced springflows in 2024. For example, while the drift-net at Spring Run 1 was set at an alternate downstream location from fall 2022 through fall 2023, flows were so low in fall 2024 that this location was moved farther downstream in Spring Run 1 to a site never previously sampled with a drift-net (Figure 20). Across all sampling efforts, dominant taxa included amphipods (*Stygobromus* spp., 50.9%), snails (*Vitropyrgus lillianae* 9.3%), and ostracods (*Comalcandona tressleri*, 5.9%). The remaining taxa each represented less than 3% of the total catch. Of the Covered Species, a total of 15 Peck's Cave Amphipods (*Stygobromus pecki*) were positively identified out of 213 total *Stygobromus* spp. and 1 larval Comal Springs Riffle Beetle was observed in 2024 (Table 5). Full drift-net results are presented in Appendix E. Over the past 5 years, the median counts of *Stygobromus* spp. per cubic meter of water filtered aligned with the long-term median from 2020 to spring 2022 (0.02 *Stygobromus*/m^3). Since fall 2022 median counts have been lower than the long-term, but means and upper quartiles have been relatively high (Figure 21). Lower counts at Spring Run 1 and Spring Run 3 in 2023 and 2024 were likely attributed to the desiccated conditions at Spring Run 1 and reduced springflow at Spring Run 3 throughout the summer and fall; whereas counts at Western Upwelling, where springflow was less variable, were higher and consistent with previous years.

Figure 20. **Photos displaying the habitat conditions during fall sampling in Spring Run 1 (A), Spring Run 3 (B), and Western Shoreline (C) and the alternate drift-net location at Spring Run 1 (A). The Spring Run 1 drift-net was moved from its usual location and past alternate locations due to all upstream sections of the run being dry.**

Table 5. **Total numbers of endangered species collected at each site during drift-net sampling in May and November 2024. Full drift-net results are presented in Appendix E.**

	SITE (TOTAL DRIFT-NET HOURS)		
TAXA	**RUN 1 (48)**	**RUN 3 (48)**	**UPWELLING (48)**
Crustaceans			
Amphipoda			
Crangonyctidae			
Stygobromus pecki	0	0	15
Insects			
Coleoptera			
Elmidae			
Heterelmis comalensis	1 (larva)	0	0

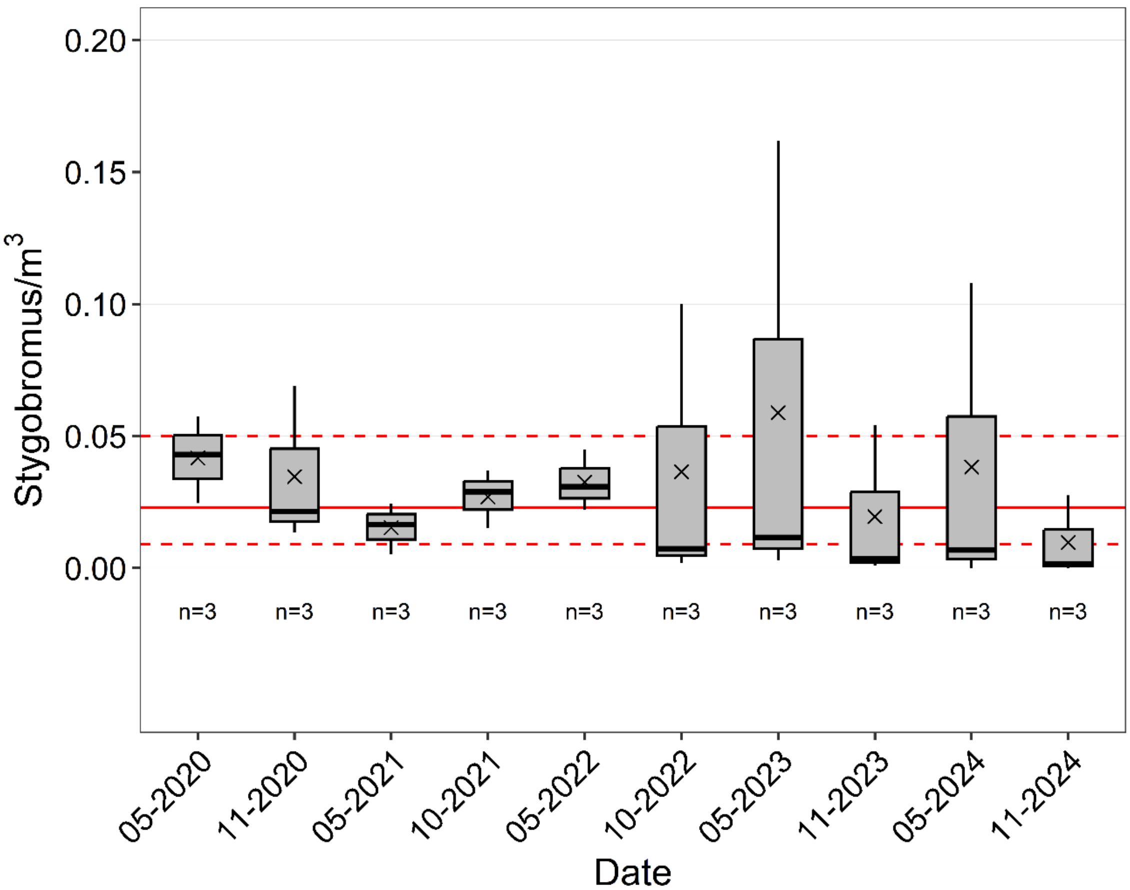

Figure 21. Boxplots displaying *Stygobromus* spp. counts per cubic meter of water (*Stygobromus*/m³) at Western Upwelling, Spring Run 1, and Spring Run 3 from 2019–2024. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range. Solid and dashed red lines denote long-term (2003–2024) medians and interquartile ranges, respectively.

Comal Springs Riffle Beetle

Ninety-nine adult Comal Springs Riffle Beetles (CSRB) were collected at 60 lures during spring and fall sampling efforts in 2024 and counts ranged from 0–30 beetles/lure. Adult beetles occupied 25% of lures across spring and fall. The two CSRB low-flow sampling events from July through October yielded 92 adult CSRB on 19 lures at Spring Island, 3 CSRB on 8 lures at Western Shoreline, and 0 CSRB on 6 lures at Spring Run 3. However, this was not included in seasonal and temporal analyses due to use of alternative sites to those typically used in biomonitoring and variation in placement methods (e.g., adjacent to conditioned wood).

For spring and fall routine sampling, only 15 of 60 lures had adult CSRB, and median counts across both seasons for all three areas were zero beetles/lure. Mean beetles per lure across all areas were higher during spring than fall at Spring Island (spring = 5.3 beetles/lure; fall = 2.7), Western Shoreline (spring = 1 beetle/lure; fall = 0.4), and Spring Run 3 (spring = 0.5

beetles/lure; fall = 0) (Figure 22). During the initial low-flow summer effort (July–August) not included for analysis, adult CSRB were detected at Spring Island (52 adult CSRB) and the Western Shoreline (3 adult CSRB) but not Spring Run 3. During the second low-flow summer effort (September–October), adult CSRB were only found at Spring Island (40 adult CSRB). In summary, counts in 2024 decreased from spring to fall across all sites. Overall, seasonal metrics were lower than historical data (Figures 22 and 23). Among all the lures set during the spring, low-flow, and fall events, only four lures had more than eight CSRB. All four lures with these values (26, 30, 33, and 47 beetles/lure) were at the same site at Spring Island; these outliers are not shown in Figures 22 and 23.

When analyzed in conjunction with the long-term dataset, a general temporal decline in the number of beetles per lure is evident across sites and seasons (Figure 23). Over the past five years, beetles per lure have rarely approached long-term medians at the Western Shoreline or Spring Run 3 (e.g., only during late 2020 through 2022), while counts at Spring Island have only been consistent with long-term averages during spring. Medians and means across all areas have been low for the past five years relative to the entire 21-year dataset. The short-term (5-yr) CSRB average across Comal Springs is now the lowest observed during 21 years of monitoring. This suggests that extended low-flow conditions during 2022–2024 may be contributing to sustained and continued declines of surface CSRB populations. That being said, it is unclear whether the declines observed during low-flow periods are true population-level trends or if catch rates are potentially confounded by imperfect detection in near-surface habitats which are the focus of sampling. Low-flow habitat utilization studies conducted by BIO-WEST in 2023 suggested that CSRB follow water levels down into the substrate when spring surface habitats are desiccated. However, all beetles in that study were still observed at optimal locations that are consistent with sites chosen for biomonitoring. Although monitoring suggests declines in surface populations with recent reductions in springflow, continued targeted research related to this species is critical in understanding the relationship between population dynamics and springflow.

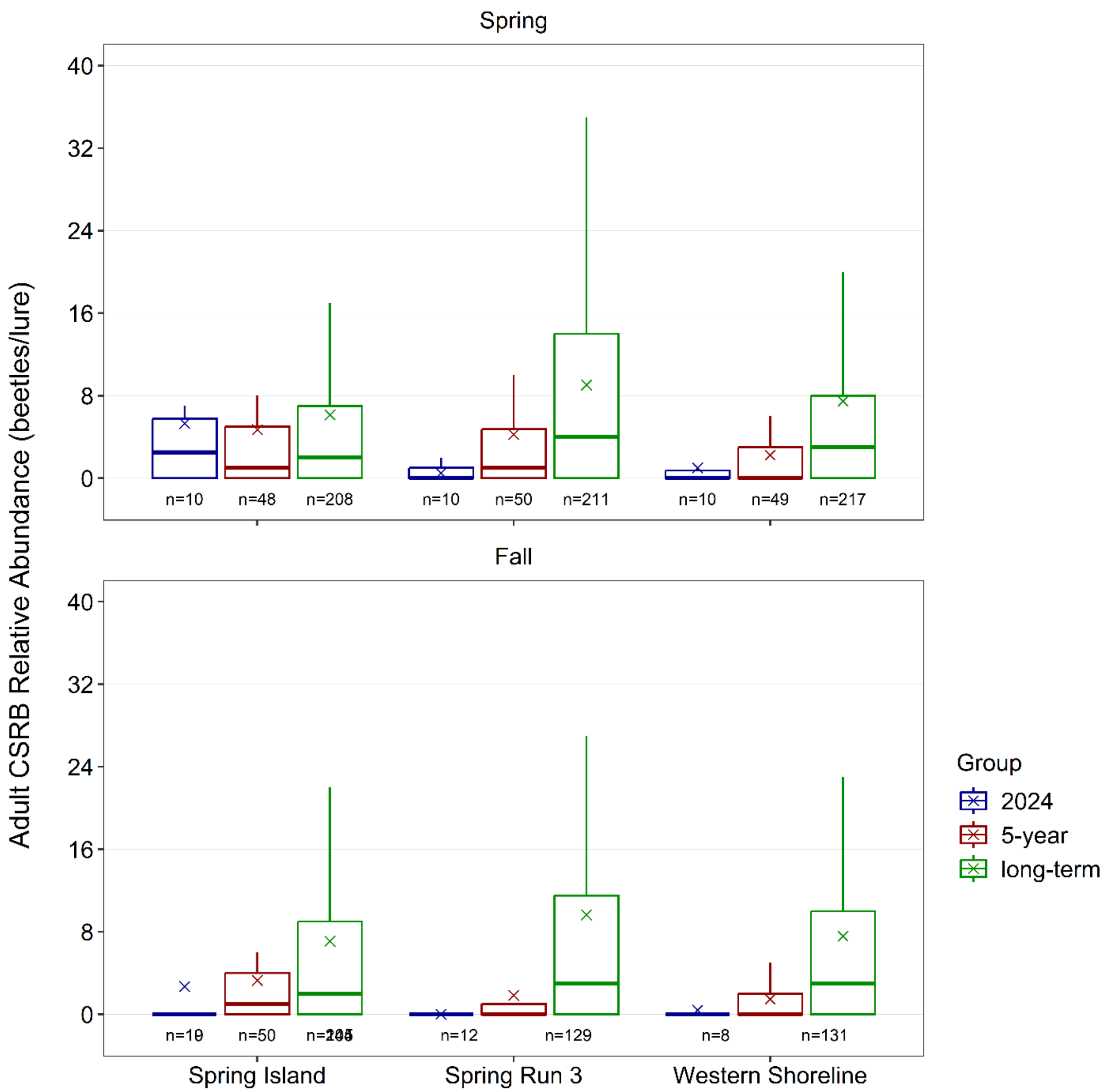

Figure 22. **Boxplots displaying 2024, 5-year (2020–2024), and long-term (2004–2024) trends in adult Comal Springs Riffle Beetle abundance per retrieved lure by season across sites in the Comal Springs. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range. The "n" values along the x-axes represent the number of lures included in each category.**

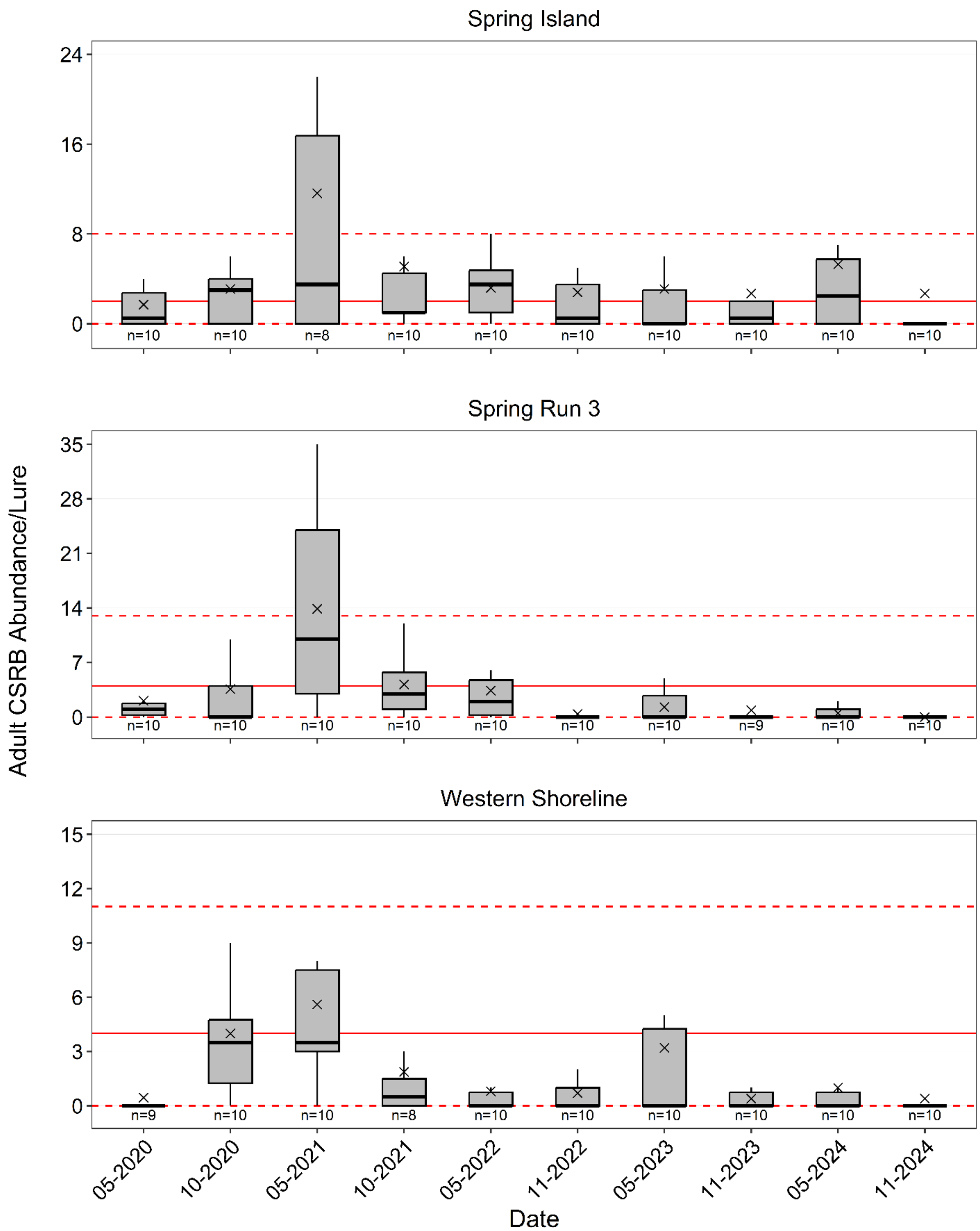

Figure 23. **Boxplots displaying temporal trends in adult CSRB abundance per retrieved lure among study reaches from 2020–2024 during lure sampling in Comal Springs. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range. The "n" values along the x-axes represent the number of lures in each category. Solid and dashed red lines denote long-term (2004–2024) medians and interquartile ranges, respectively.**

Benthic Macroinvertebrate Rapid Bioassessment

Benthic macroinvertebrate rapid bioassessment data was collected during both the spring and fall sampling events in 2024 (raw data presented in Appendix F). All samples in 2024 consisted of kick samples with suitable cobble-gravel habitat. In addition, organic material was also sampled at each site, either in the form of debris jams or root wads. Cumulative scores and corresponding aquatic-life-use designations are displayed in Figure 24, while metric scores for calculating the B-IBI can be found in Table 6. A total of 828 and 765 individual macroinvertebrates, representing 35 and 44 unique taxa were sampled in spring and fall, respectively. Altogether, 52 unique taxa were represented among all samples from 2024.

Table 6. Metric value scoring ranges for calculating the Texas RBP B-IBI (TCEQ 2014).

METRIC	SCORING CRITERIA			
	4	3	2	1
Taxa richness	>21	15–21	8–14	<8
EPT taxa abundance	>9	7–9	4–6	<4
Biotic index (HBI)	<3.77	3.77–4.52	4.56–5.27	>5.27
% Chironomidae	0.79–4.10	4.11–9.48	9.49–16.19	<0.79 or >16.19
% Dominant taxon	<22.15	22.15–31.01	31.02–39.88	>39.88
% Dominant FFG	<36.50	36.50–45.30	45.31–54.12	>54.12
% Predators	4.73–15.20	15.21–25.67	25.68–36.14	<4.73 or >36.14
Ratio of intolerant: tolerant taxa	>4.79	3.21–4.79	1.63–3.20	<1.63
% of total Trichoptera as Hydropsychidae	<25.50	25.51–50.50	50.51–75.50	>75.50 or no Trichoptera
# of non–insect taxa	>5	4–5	2–3	<2
% Collector–gatherers	8.00–19.23	19.24–30.46	30.47–41.68	<8.00 or >41.68
% of total number as Elmidae	0.88–10.04	10.05–20.08	20.09–30.12	<0.88 or >30.12

Benthic IBI scores ranged from 15 during fall at Landa Lake resulting in “Limited” designation, to 34 during both seasons at New Channel resulting in a “High” designation. Lower scores observed at Upper Spring Run and Landa Lake compared to riverine sites were likely due to differences in mesohabitats available for sampling. Specifically, these communities are naturally different compared to the “least-disturbed reference streams”, which contain swifter riffle habitats. As such, higher scores would be expected at riverine sites due to a higher likelihood of supporting more fluvial specialists, resulting in greater taxa diversity overall. It should also be noted that most reference streams do not exhibit the stenothermal conditions present within the Comal Springs/River System and this may result in differing community composition. Based on this, the value of the score is less important in this spring-associated system than the consistency or trends in results per reach over time.

Aquatic-life-use designations in 2024 generally aligned with years prior and indicate stable trends at most reaches (Figure 24). Scores in the New Channel have been very consistent over the past five years, scoring “High” in all but one sampling event. In fall 2024, the Upper Spring Run scored the lowest (“Limited”) of any sampling period during the past five years, potentially corresponding to lower water levels and lack of flow in this area exacerbated by the ongoing drought. The Old Channel was described as “Intermediate” for both seasons, with scores similar to 2023 and was generally comparable, although slightly lower, to previous years. Aquatic-life-use at Landa Lake was ranked as “Limited” during both sampling events, maintaining the lower scores typically observed in this reach. Reduced water levels observed in Landa Lake during fall 2022 and fall 2023 might have increased velocity near the substrate in some areas, which in turn supported greater habitat diversity and resulted in higher scores than were observed historically when lake levels were higher, but flows during fall 2024 were perhaps too low to maintain this habitat diversity. The Other Place ranked as "Intermediate" for both seasons with scores notably lower since the drought started in fall 2022. Reduced flows at this riverine reach may have resulted in homogenization of habitats, and thus a reduction in fluvial specialists. Additional monitoring will be needed to see if observed trends continue at Landa Lake and Other Place, as well as to generate a robust reference dataset for the development of scoring criteria specific to this unique ecosystem, providing a more accurate realization of ecological health.

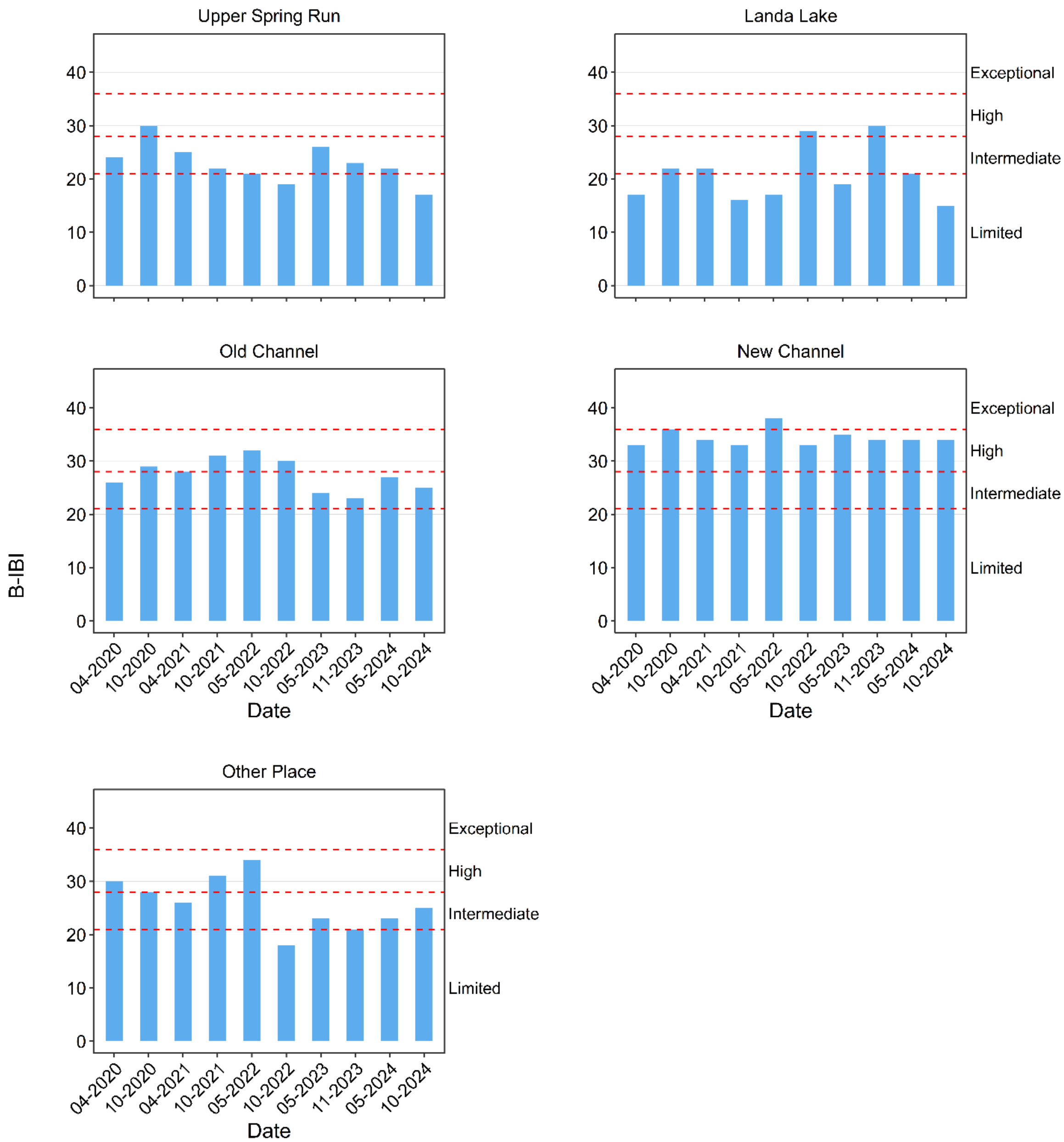

Figure 24. **Benthic macroinvertebrate Index of Biotic Integrity (B-IBI) scores and aquatic-life-use designations from 2020–2024 in the Comal Springs/River.**

CONCLUSION

Results from 2024 biological monitoring in the Comal Springs/River system indicated continued declining trends in discharge from ongoing drought conditions and subsequent declines in some Covered Species population metrics. Median annual mean daily discharge in 2024 (125 cfs) was below 10th percentile flows for all months. Spatial patterns in water temperature fluctuation were typical, with low variation in reaches closer to springs (i.e., Landa Lake) and higher variation at reaches farther from springs (i.e., Other Place). Temperature exceedance of Fountain Darter larval and egg production thresholds increased in frequency and duration throughout the summer. Additionally, atypically larger increases in temperature were observed near Upper Spring Run and Spring Island in association with decreases in discharge.

Degraded habitat conditions were noted at upper spring reaches and spring runs (e.g., Spring Run 1 was dry throughout the summer and fall). Where wetted surface habitat was available for Comal Springs Salamanders, counts and catch rates decreased significantly by fall, except at Spring Island Outfall. Salamander monitoring following previous drought years suggests that Comal Springs Salamanders populations will return to Spring Run 1 and Spring Island Spring Run when surface flows return; however, continued monitoring is necessary to confirm this and document how quickly recolonization occurs. Degraded habitat conditions at upper spring reaches and spring runs also influenced spring macroinvertebrates (i.e., *Stygobromus* sp., Comal Springs Riffle Beetle). Lower riffle beetle counts this year, when compared to historical observations, suggests the current extended drought may have resulted in reduced abundance. However, subsurface migration of both salamanders and riffle beetles may yield reductions in counts that are not accurate representations of true population abundance. For Comal Springs Riffle Beetle, a separate population assessment is being completed to gain a greater understanding of population dynamics.

Vegetation mapping demonstrated that seasonal patterns in total aquatic vegetation coverage varied spatially. Coverages at Upper Spring Run and both New Channel reaches were higher than long-term averages in spring and fall; whereas, coverages at Landa Lake and Old Channel were lower than expected. Habitat suitability indices at Landa Lake and Old Channel remained below long-term averages which was likely due to reductions in bryophytes and *Cabomba* coverage. Despite lower OHSI for Fountain Darters in these reaches, Fountain Darter densities were higher than expected until fall. Declines in Fountain Darter densities by fall in the Old Channel were attributed reductions in quality habitat, as bryophytes were greatly reduced and only one small patch of *Cabomba* remained. Despite higher vegetation coverages at Upper Spring Run and the New Channel, degraded Fountain Darter populations were apparent by fall. Much of the increased vegetation was due to expansion of *Chara* (Upper Spring Run) or *Hygrophila* (Upper New Channel), which alone do not provide optimal Fountain Darter habitat. Population impacts in these reaches were likely influenced by greater variability in environmental conditions, including decreased bryophyte coverage, and potentially larger and more frequent exceedances of reproductive temperature thresholds due to reduced springflow. Overall lower densities and occurrence rates observed in fall 2024 indicate potential negative effects of extended periods of low flow in Comal Springs.

Evidence of detectable temporal trends in fish communities varied among the selected metrics, as well as between and within study segments. Species richness and diversity were typically higher in riverine areas and lowest at Landa Lake. Five-year trends in species richness usually varied among events and displayed no detectable patterns. Relative density of spring fishes remained consistently high and varied substantially less at Landa Lake than other segments. Abrupt declines in relative density of spring fishes in the fall at New Channel may be influenced by prolonged periods of low flow with no flow pulses. Temporal trends in richness of spring-associated fishes were congruent with community-level observations and generally stable throughout the study area.

In summary, 2024 biological monitoring provided insights into the current condition of the EAHCP Covered Species in the Comal Springs/River System, and documented important flow-ecology relationships driving population dynamics. Results indicated variability in aquatic habitat conditions among reaches and resulting reductions in population metrics of multiple Covered Species. Overall, declines in system stability have become more apparent after two consecutive years of extremely low flows. Historical data indicates that ecological conditions will likely improve when typical flows return. Subsequent monitoring efforts will provide opportunities to better understand the dynamics of this complex ecological system and how it responds to future hydrologic conditions.

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APPENDIX A: CRITICAL PERIOD MONITORING SCHEDULES

COMAL RIVER/SPRINGS
Critical Period Low-Flow Sampling – Schedule and Parameters

FLOW TRIGGER (+ or - 10 cfs)	PARAMETERS
200 cfs	Full Sampling Event
150 cfs	Full Sampling Event
120 - 80 cfs	Riffle Beetles and spring discharge – Every 10 cfs decline (maximum weekly)
100 cfs	Full Sampling Event
100 - 50 cfs	Habitat Evaluations - Every 10 cfs decline (maximum weekly)
50 cfs	Full Sampling Event
50 - 0 cfs	Habitat Evaluations - Every 10 cfs decline (maximum weekly)
10 - 0 cfs	Full Sampling Event
RECOVERY	
25 - 100 cfs	Full Sampling Event (dependent on flow stabilization)
100 - 200 cfs	Full Sampling Event (dependent on flow stabilization)

PARAMETER DESCRIPTION

Full Sampling Event	Aquatic Vegetation Mapping Fountain Darter Sampling Drop Net, Dip net (Presence/Absence), and Visual Parasite evaluations Fish Community Sampling Salamander Sampling - Visual Riffle Beetle – Cotton lure sampling Fish Sampling - Exotics/Predation (100 cfs and below) Water Quality - Suite I and Suite II
Riffle Beetle Monitoring	Spring discharge and wetted perimeter measurements
Habitat Evaluations	Photographs

COMAL RIVER/SPRINGS
Species-Specific Triggered Sampling

FLOW RATE (+ or - 5 cfs)	SPECIES	FREQUENCY	PARAMETERS
≤150 or ≥80 cfs	Fountain Darter	Every other month	Aquatic vegetation mapping to include Upper Spring Run reach, Landa Lake, Old Channel reach, and New Channel reach
≤150 or ≥80 cfs	Fountain Darter	Every other month	Conduct Dip net sampling/visual parasite evaluations at five (5) sites in the Upper Spring Reach; twenty (20) sites in Landa Lake; twenty (20) sites in the Old Channel reach and; at five (5) sites in the New Channel reach.
≤60 cfs	Fountain Darter	Weekly	Conduct Dip net sampling/visual parasite evaluations at five (5) sites in the Upper Spring Reach; twenty (20) sites in Landa Lake; twenty (20) sites in the Old Channel reach and; at five (5) sites in the New Channel reach.
≤60 cfs	Fountain Darter	Monthly	Aquatic vegetation mapping at Upper Spring Run reach, Landa Lake, Old Channel reach, and New Channel reach
≤120 cfs	Comal Springs Riffle Beetle	Every 2 weeks	Monitoring via cotton lures at Spring Run 3, western shore of Landa Lake, and Spring Island upwelling
≤120 cfs or ≥80 cfs	Comal Springs Salamander	Every other week	Salamander snorkel surveys will be conducted at three sites (Spring Runs 1 and 3 and the Spring Island area)
≤80 cfs	Comal Springs Salamander	Weekly	Salamander snorkel surveys will be conducted at three sites (Spring Runs 1 and 3 and the Spring Island area)

APPENDIX B: LOW-FLOW CRITICAL PERIOD WATER QUALITY SAMPING

Water Quality Sampling Results

Table B1. **Water quality sampling at select stations during Low-flow Critical Period Monitoring in July 2024. Measurements were taken at the middle of the water-column.**

Site	Date	Time	Temp (°C)	SpCond (µs/cm)	pH	D.O. (mg/L)	Depth (ft)	Velocity (ft/s)	Weather Conditions
Blieder's Creek	2024-07-02	8:16	28.5	594	7.54	6.81	1.7	0.00	Sunny, 79(F), clear water
Heidelberg Main Channel	2024-07-02	8:29	24.9	606	7.17	4.00	2.3	0.01	Sunny, 80(F), clear water
Island Park Far	2024-07-02	8:47	24.4	607	7.23	5.72	1.5	0.09	Sunny, 81(F), clear water
Island Park Near	2024-07-02	8:54	23.9	604	7.18	4.64	3.7	0.12	Sunny, 81(F), clear water
Landa Lake	2024-07-02	9:49	24.2	604	7.22	5.97	1.9	0.58	Sunny, 84(F), clear water
Spring Run 3	2024-07-02	9:56	23.8	606	7.26	5.53	0.3	0.80	Sunny, 85(F), clear water
Spring Run 2	2024-07-02	9:27	23.7	606	7.20	4.87	1.1	0.03	Sunny, 83(F), clear water
Spring Run 1	2024-07-02	9:17	24.2	601	7.49	6.49	1.0	0.03	Sunny, 83(F), clear water
SR1-SR2 Confluence	2024-07-02	9:39	24.3	606	7.46	6.26	1.1	0.05	Sunny, 84(F), clear water
Old Channel Upstream	2024-07-02	10:13	24.2	604	7.30	5.29	3.9	0.63	Sunny, 86(F), clear water
Old Channel Downstream	2024-07-02	10:31	24.7	603	7.50	7.72	2.5	0.85	Sunny, 87(F), clear water
New Channel Upstream	2024-07-02	10:47	24.6	606	7.64	7.22	1.3	1.57	Sunny, 88(F), clear water
New Channel Downstream	2024-07-02	10:55	25.3	604	7.64	7.63	4.9	0.01	Sunny, 88(F), clear water

Table B2. **Lab results from water quality grab samples collected at select stations during Low-flow Critical Period Monitoring on July 2, 2024. The unit for each parameter is milligrams per liter (mg/L). ND for each parameters denotes that it was not detectable.**

Site	Nitrate as N	Total N	Ammonia	Total P	Alkalinity	Total Suspended Solids
Blieder's Creek	0.967	ND	0.066	0.0107	237	10.9
Heidelberg Main Channel	1.52	1.52	0.044	ND	237	1.16
Island Park Far	1.65	1.65	ND	ND	245	ND
Island Park Near	1.74	1.74	ND	ND	244	ND
Landa Lake	1.73	1.73	ND	ND	246	ND
Spring Run 3	1.66	1.66	0.042	ND	242	ND
Spring Run 2	1.64	1.64	ND	ND	238	8
Spring Run 1	1.53	1.53	0.043	ND	240	1.16
New Channel Upstream	1.47	1.47	ND	ND	242	ND
Old Channel Upstream	1.41	1.41	ND	ND	236	1.89
Old Channel Downstream	1.4	1.4	ND	ND	244	3.05
New Channel Downstream	1.57	1.57	0.047	ND	239	7.68

APPENDIX C: AQUATIC VEGETATION MAPS

Long-term Biological Goals Study Reaches

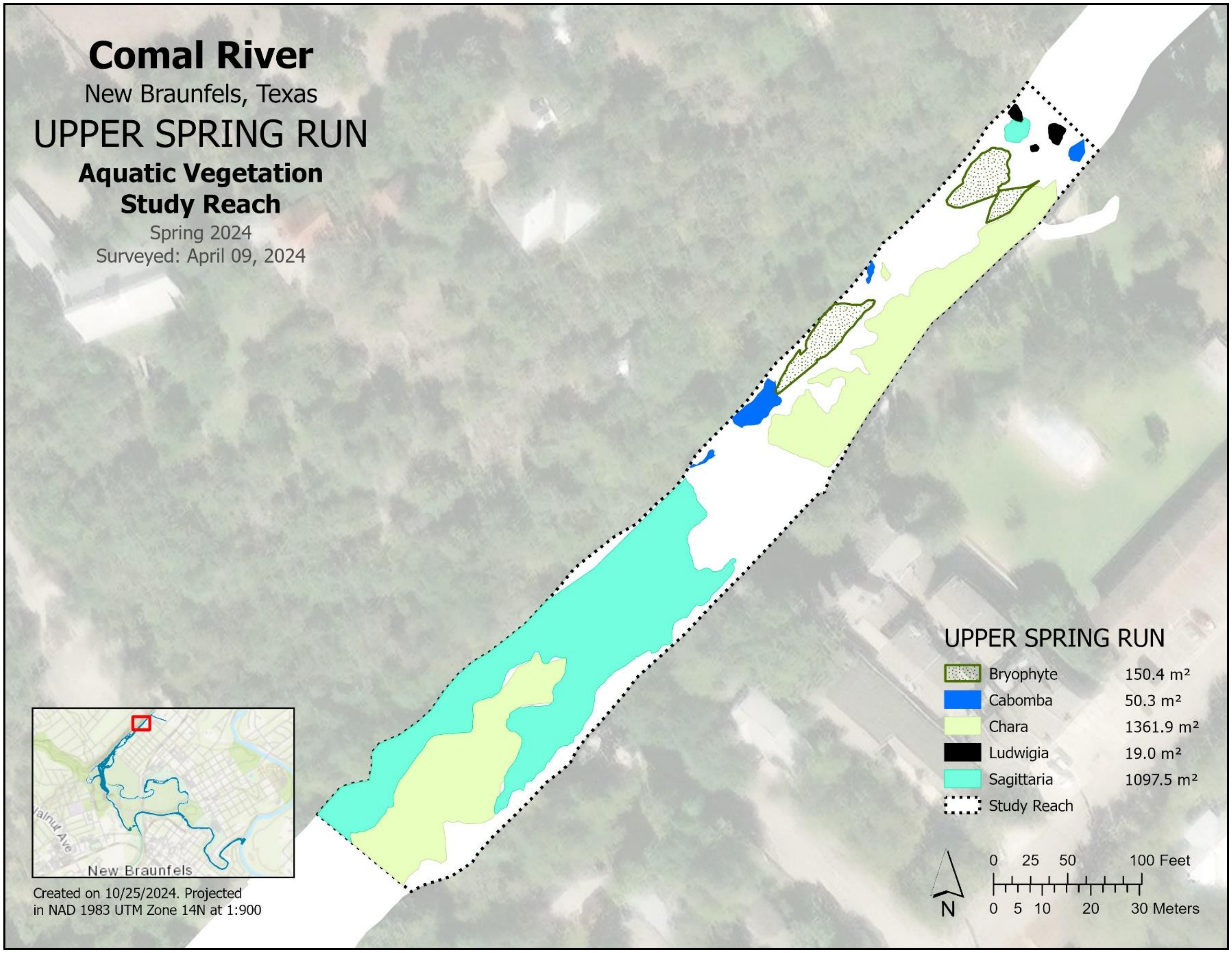

Figure C1. Map of aquatic vegetation coverage at Upper Spring Run Study Reach in spring 2024.

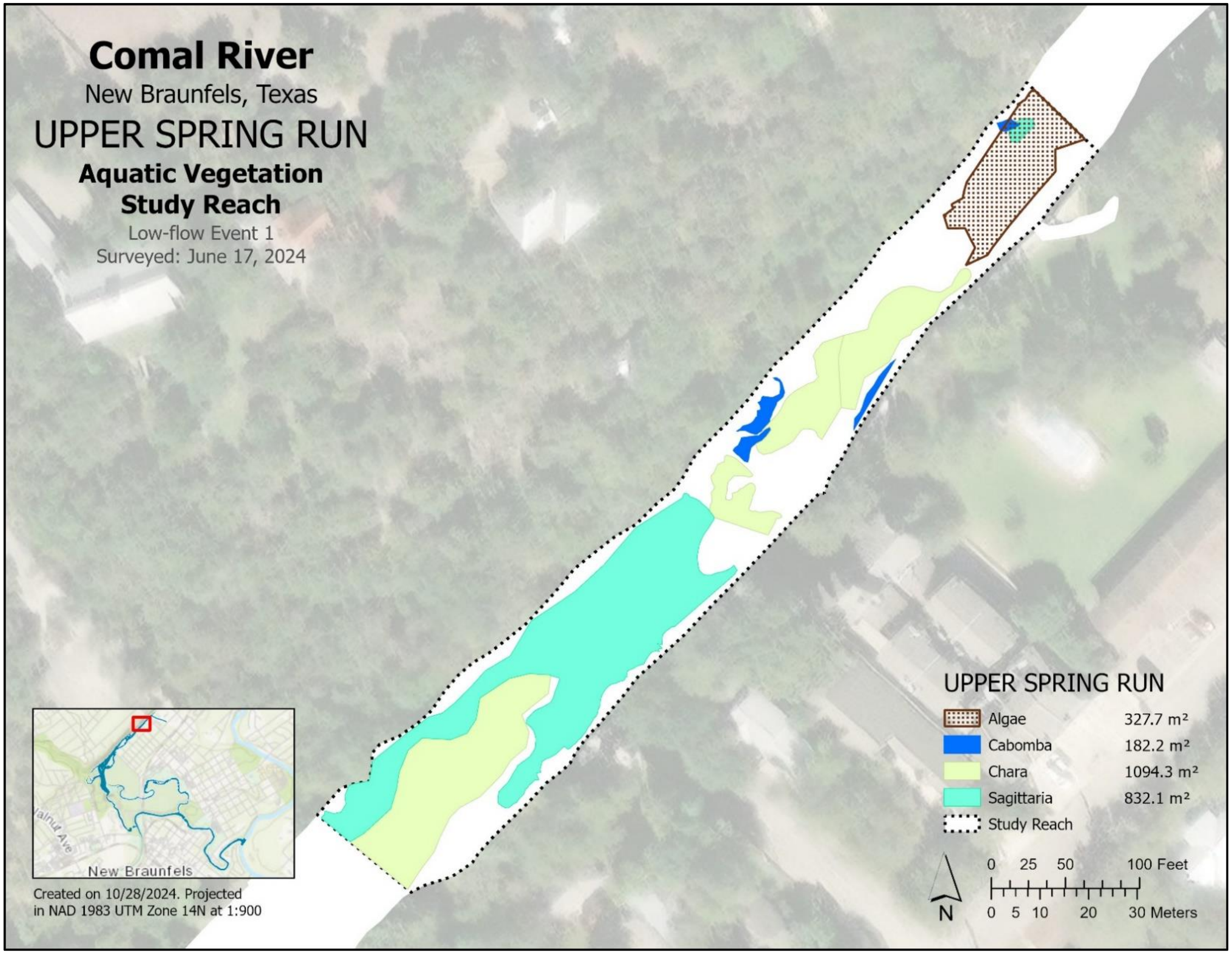

Figure C2. **Map of aquatic vegetation coverage at Upper Spring Run Study Reach in summer 2024 during the first Critical Period low-flow sampling event (June).**

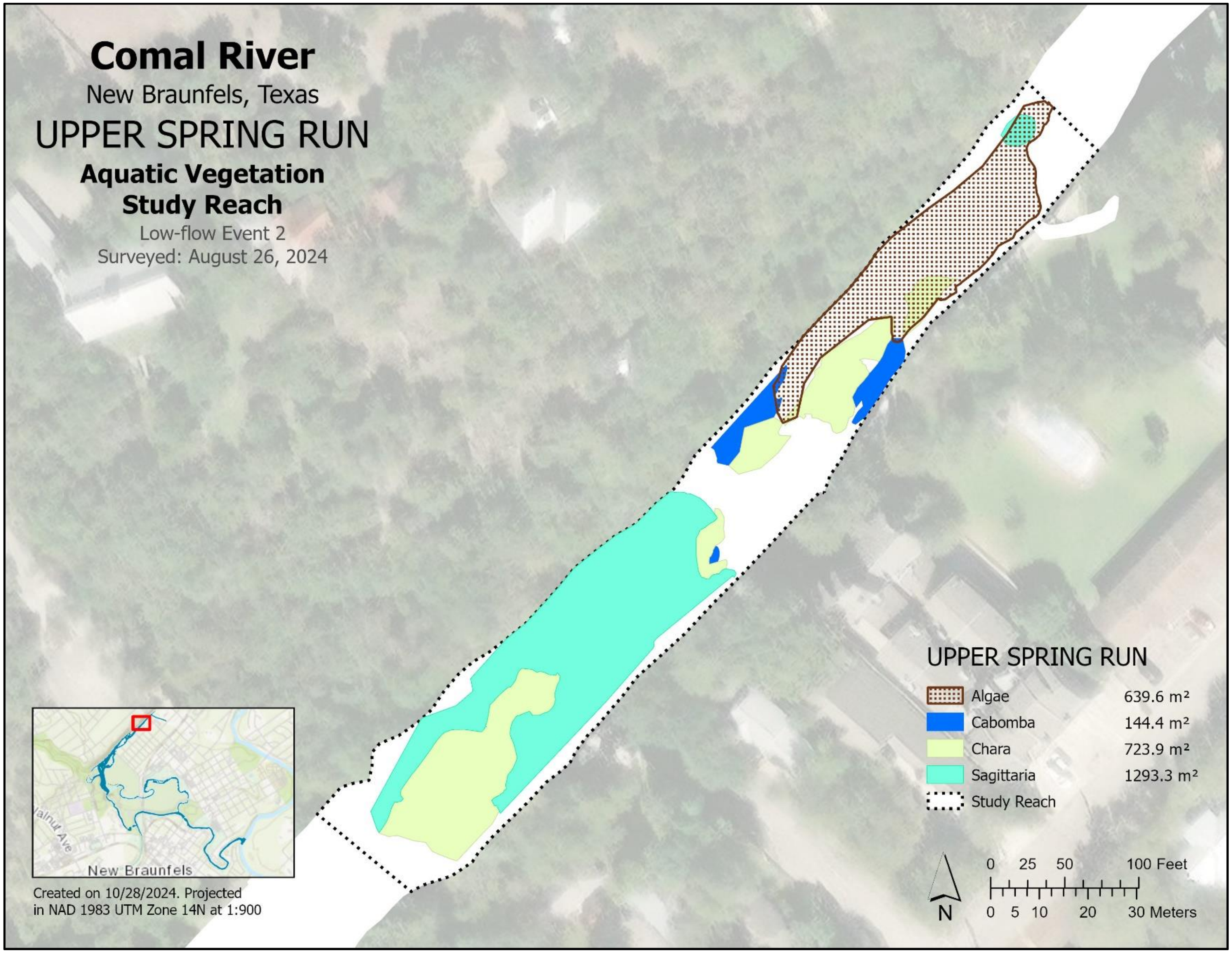

Figure C3. **Map of aquatic vegetation coverage at Upper Spring Run Study Reach in summer 2024 during the second low-flow sampling event (August).**

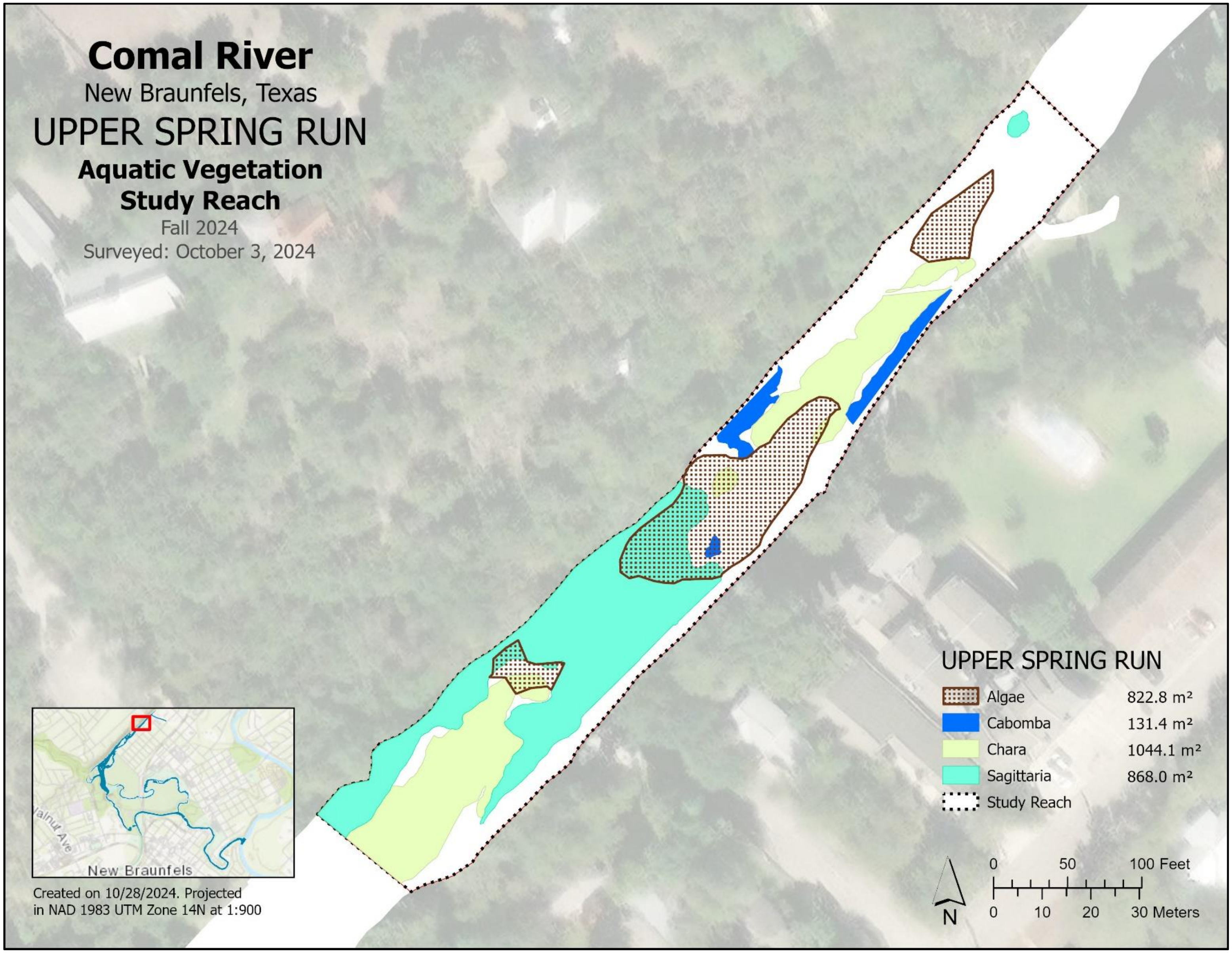

Figure C4. Map of aquatic vegetation coverage at Upper Spring Run Study Reach in fall 2024.

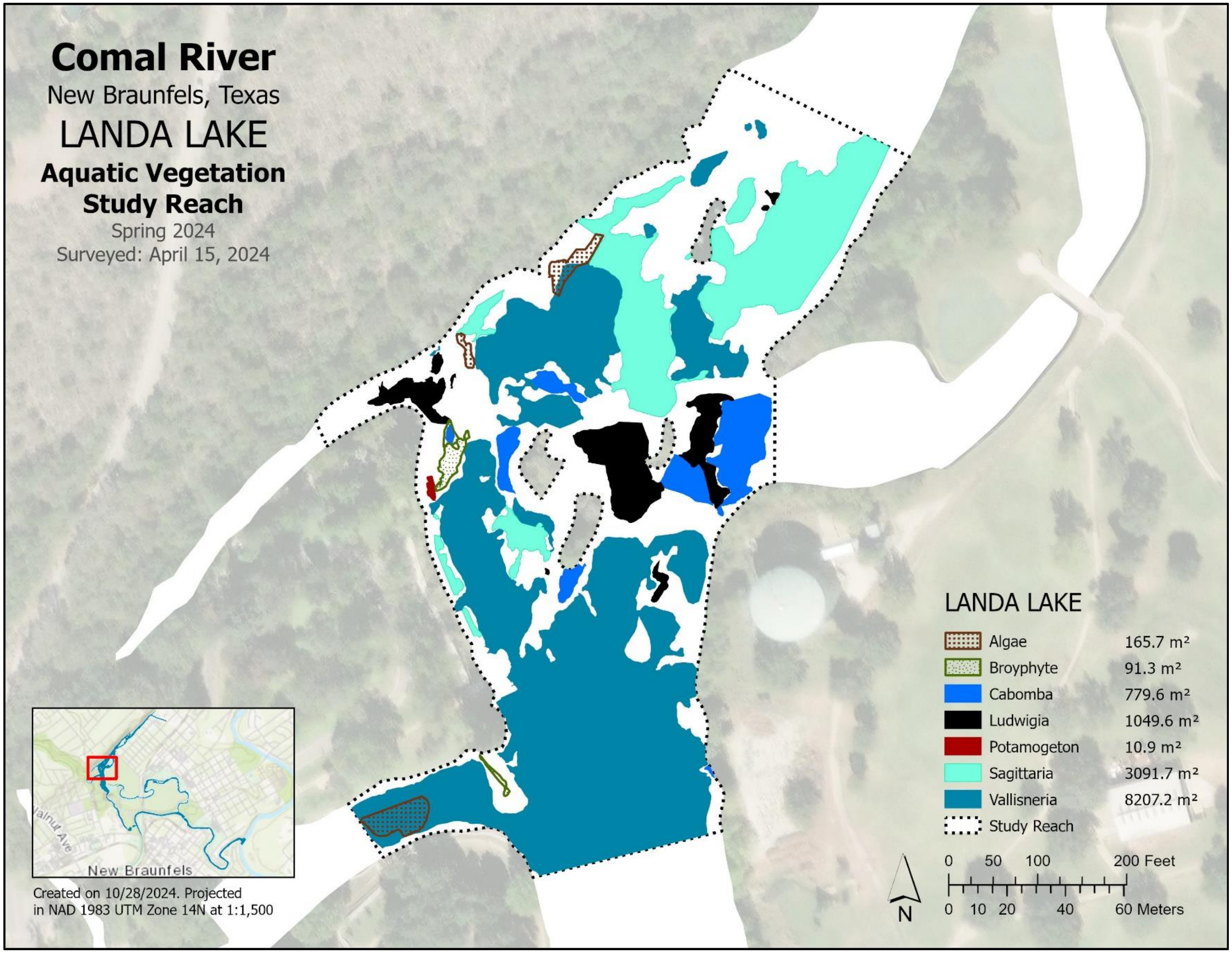

Figure C5. Map of aquatic vegetation coverage at Landa Lake Study Reach in spring 2024.

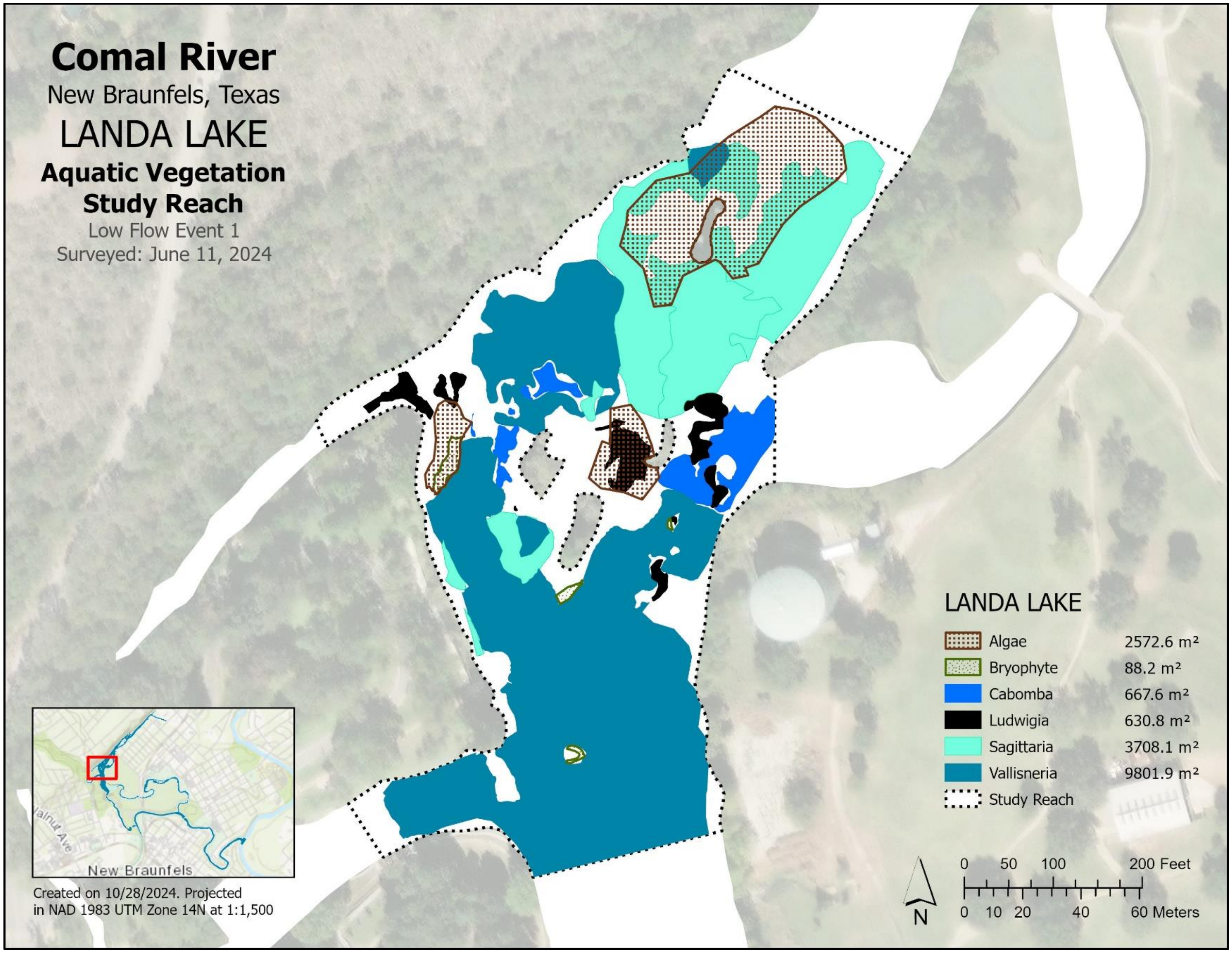

Figure C6. **Map of aquatic vegetation coverage at Landa Lake Study Reach in summer 2024 during the first Critical Period low-flow sampling event (June).**

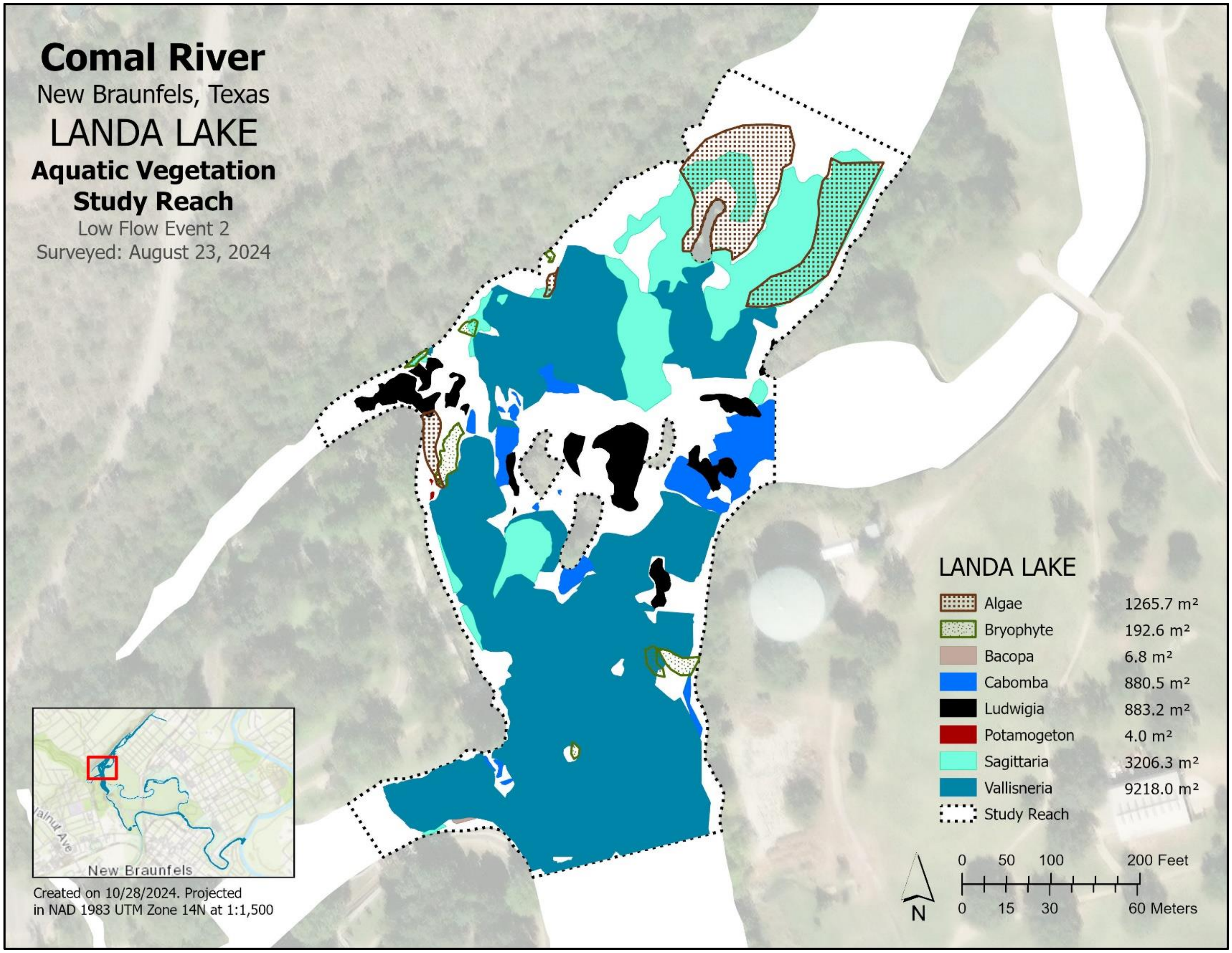

Figure C7. **Map of aquatic vegetation coverage at Landa Lake Study Reach in summer 2024 during the second low-flow sampling event (August).**

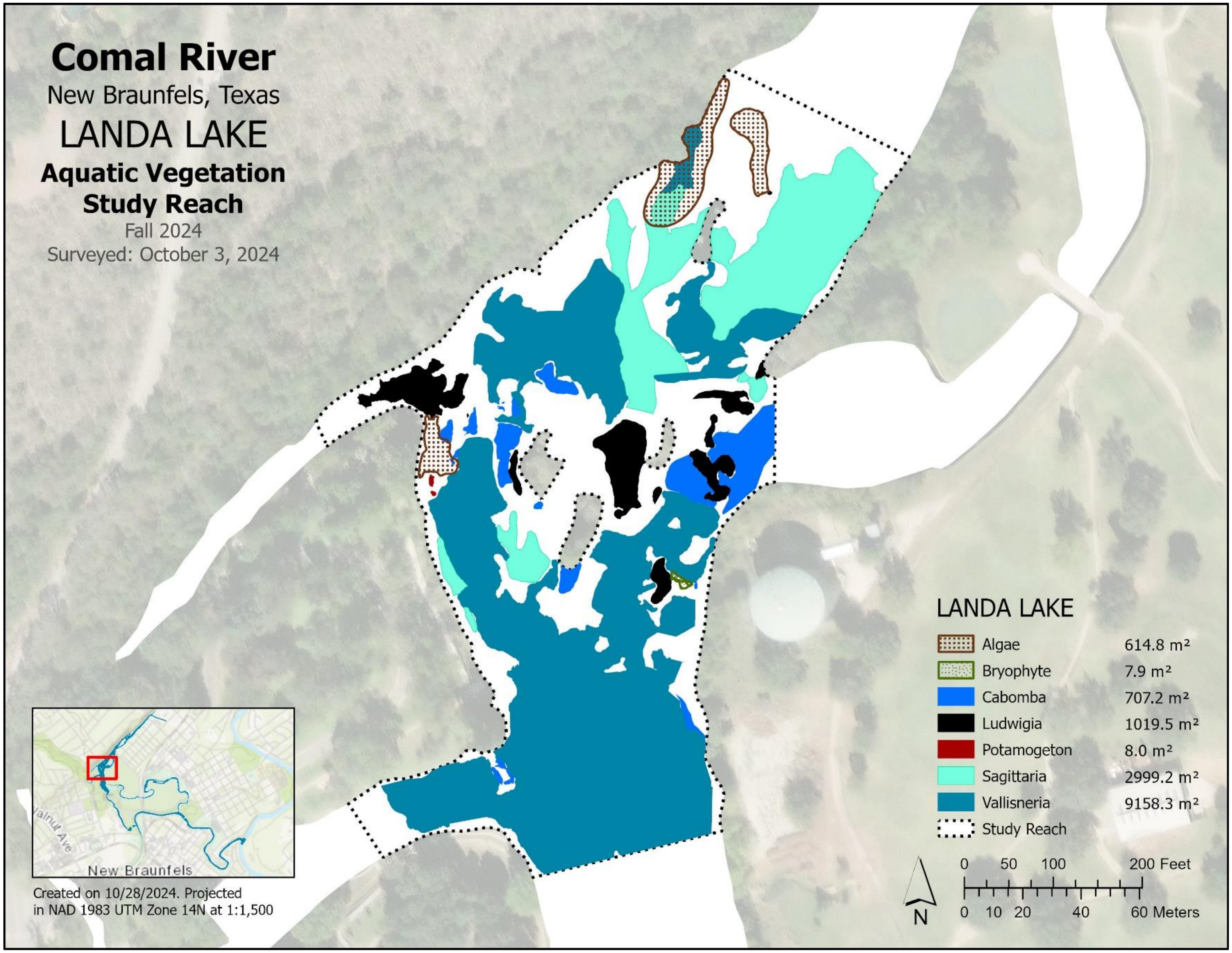

Figure C8. Map of aquatic vegetation coverage at Landa Lake Study Reach in fall 2024.

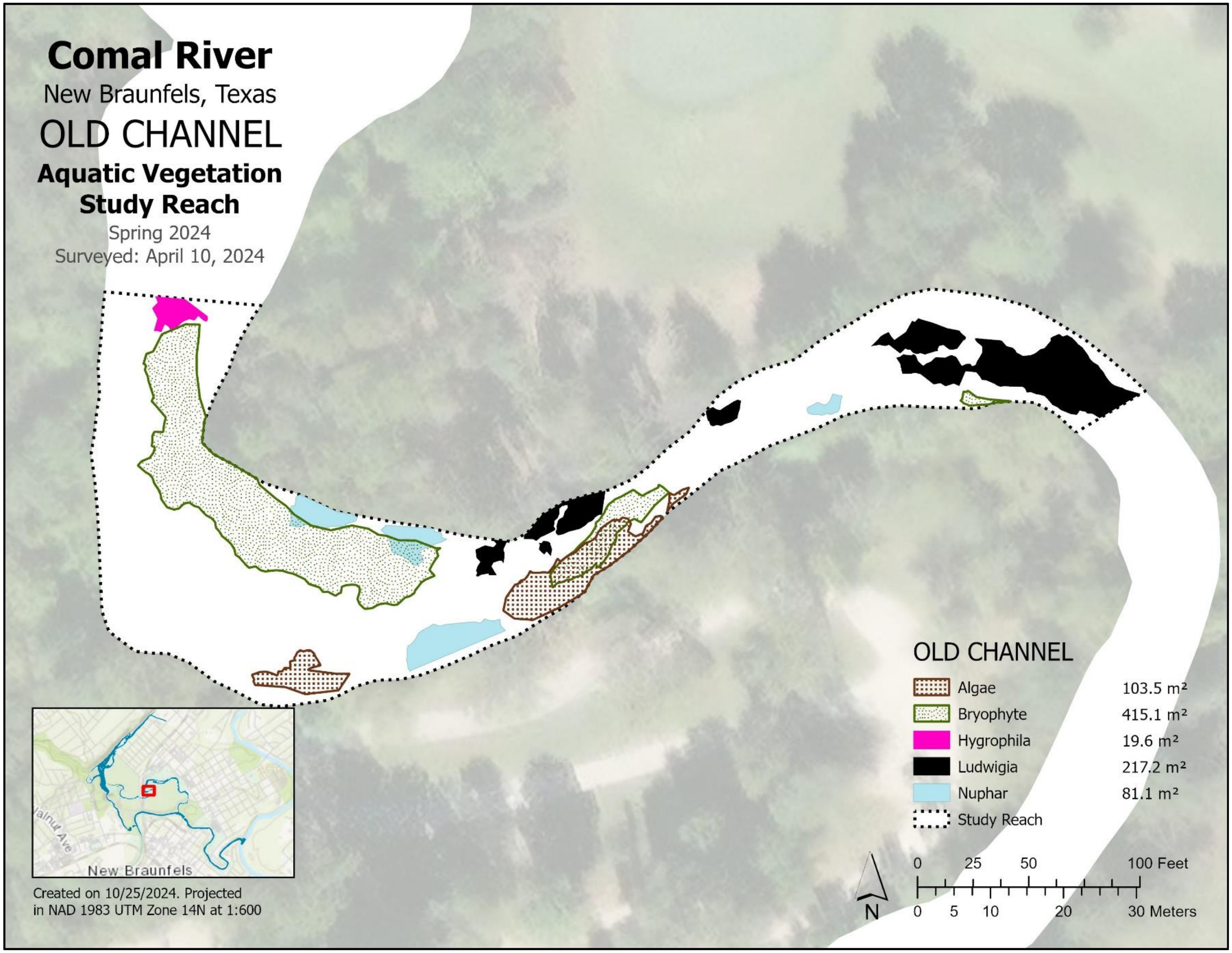

Figure C9. Map of aquatic vegetation coverage at Old Channel Study Reach in spring 2024.

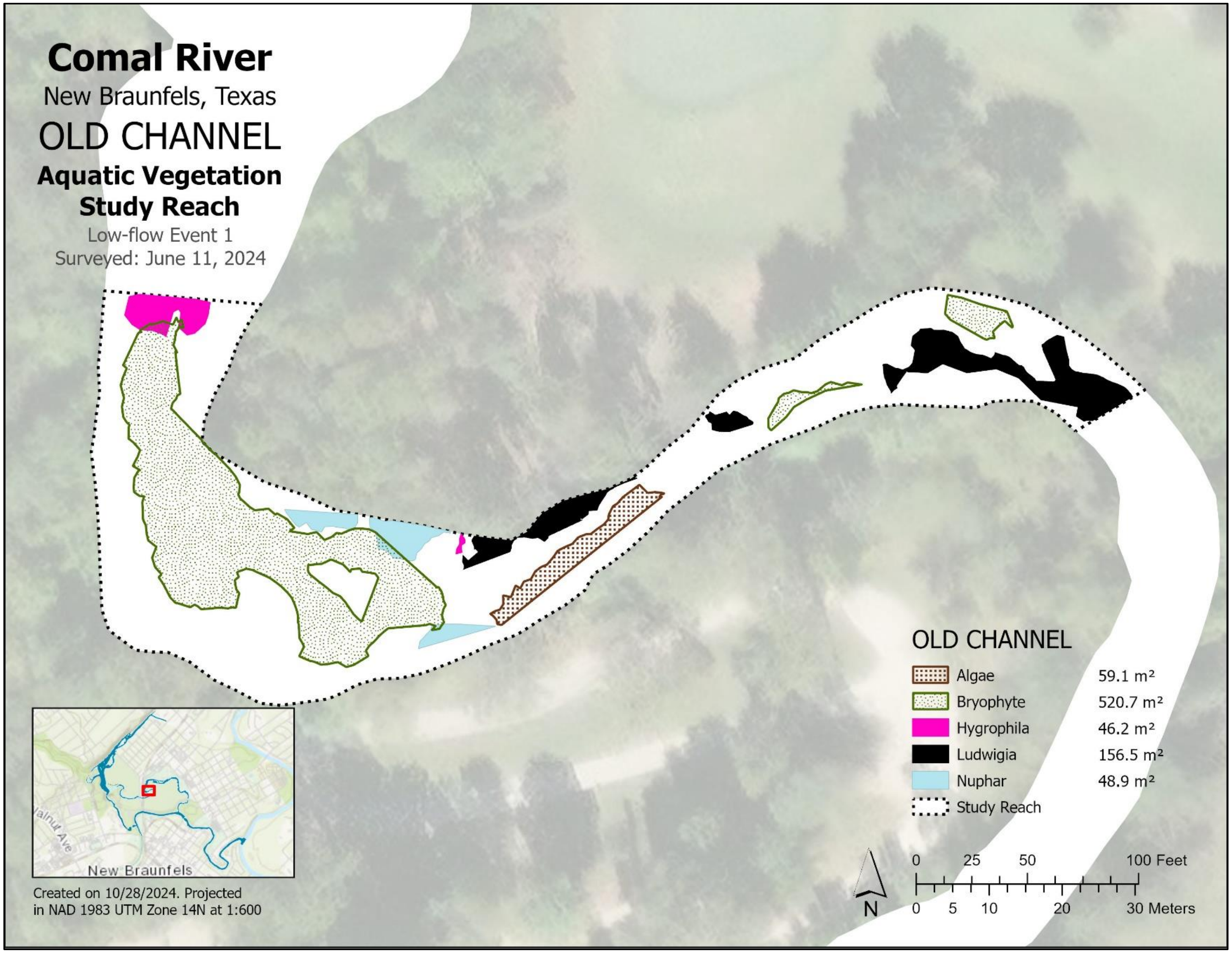

Figure C10. Map of aquatic vegetation coverage at Older Channel Reach in summer 2024 during the first Critical Period low-flow sampling event (June).

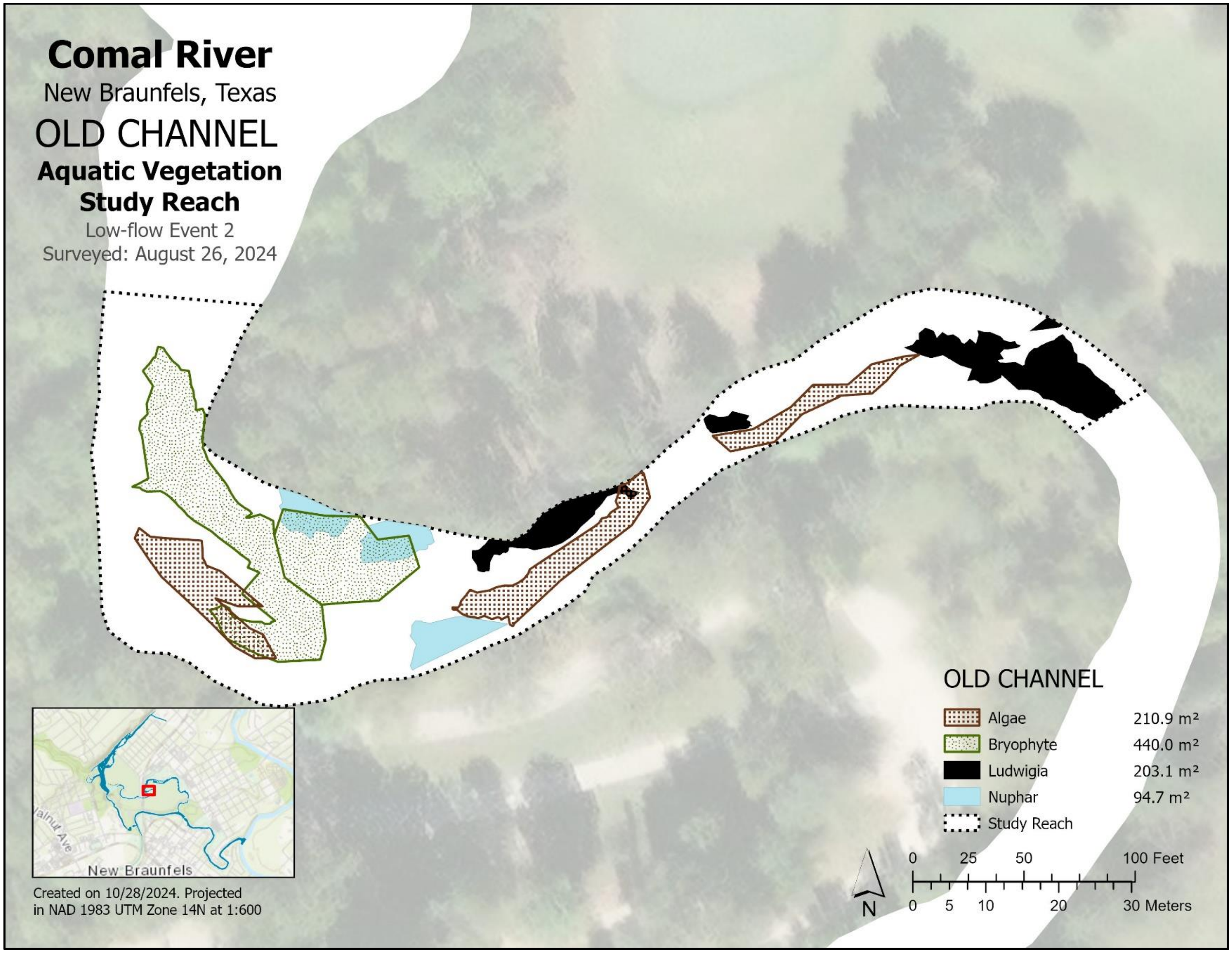

Figure C11. Map of aquatic vegetation coverage at Old Channel Study Reach in summer 2024 during the second low-flow sampling event (August).

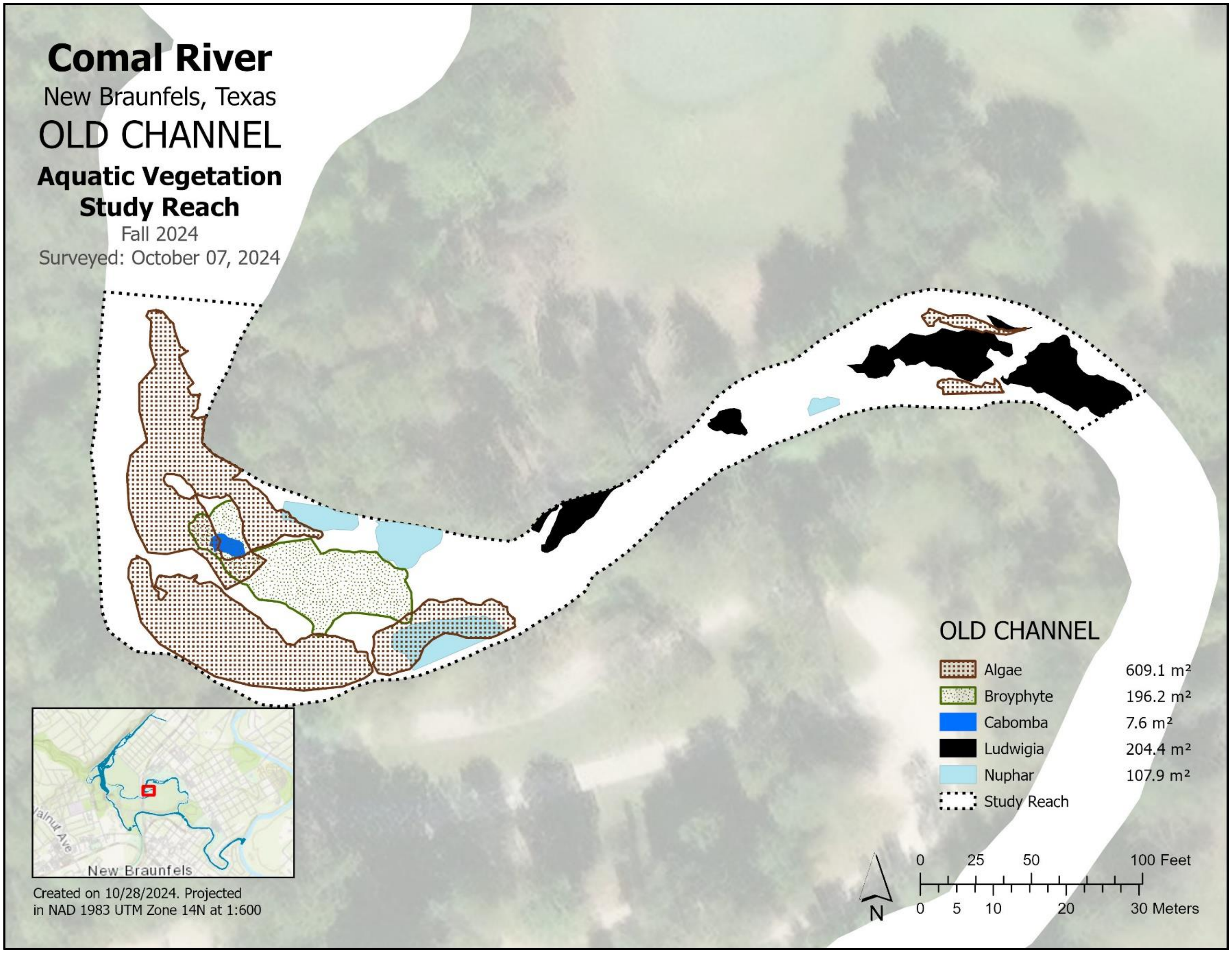

Figure C12. Map of aquatic vegetation coverage at Old Channel Study Reach in fall 2024.

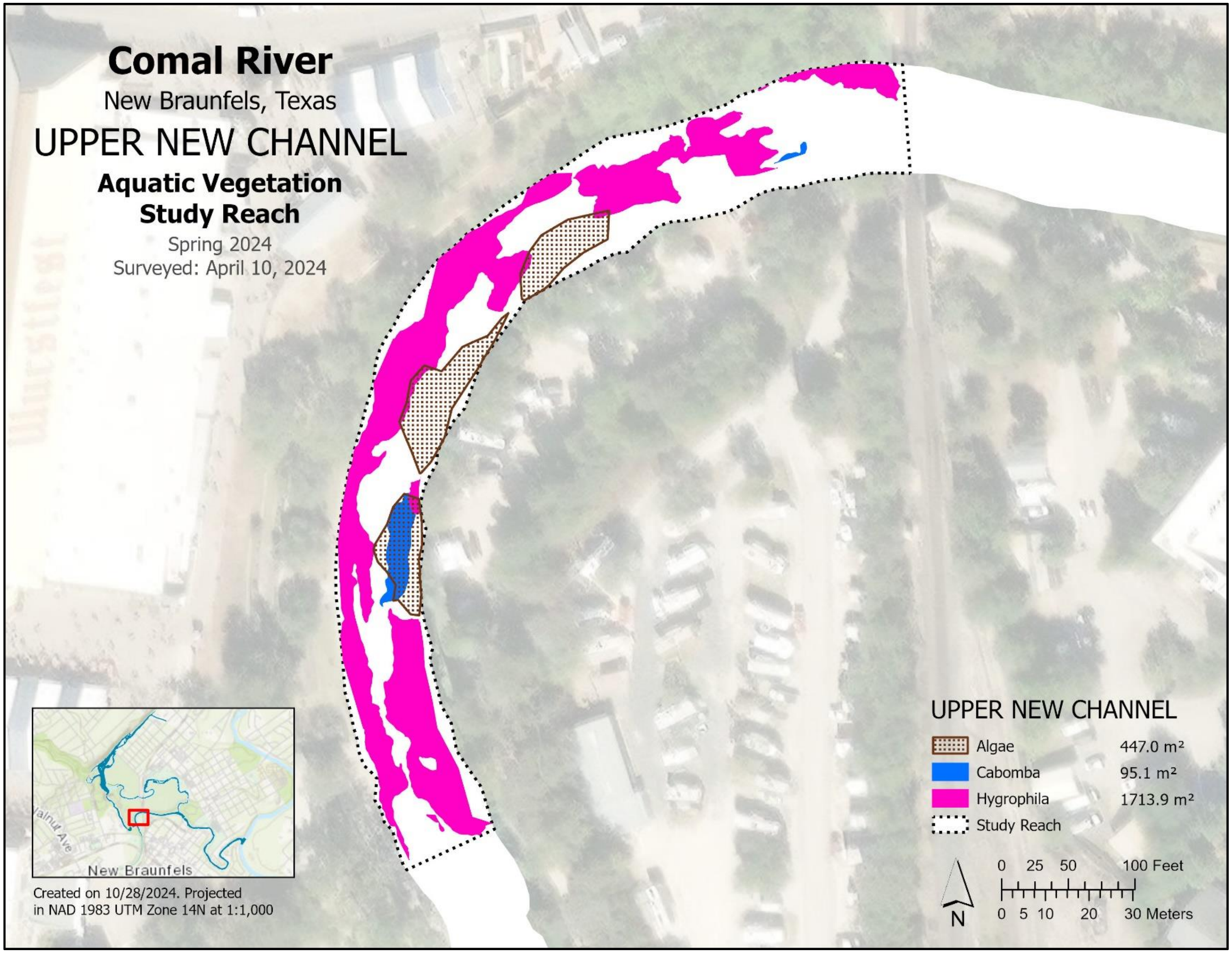

Figure C13. Map of aquatic vegetation coverage at Upper New Channel Study Reach in spring 2024.

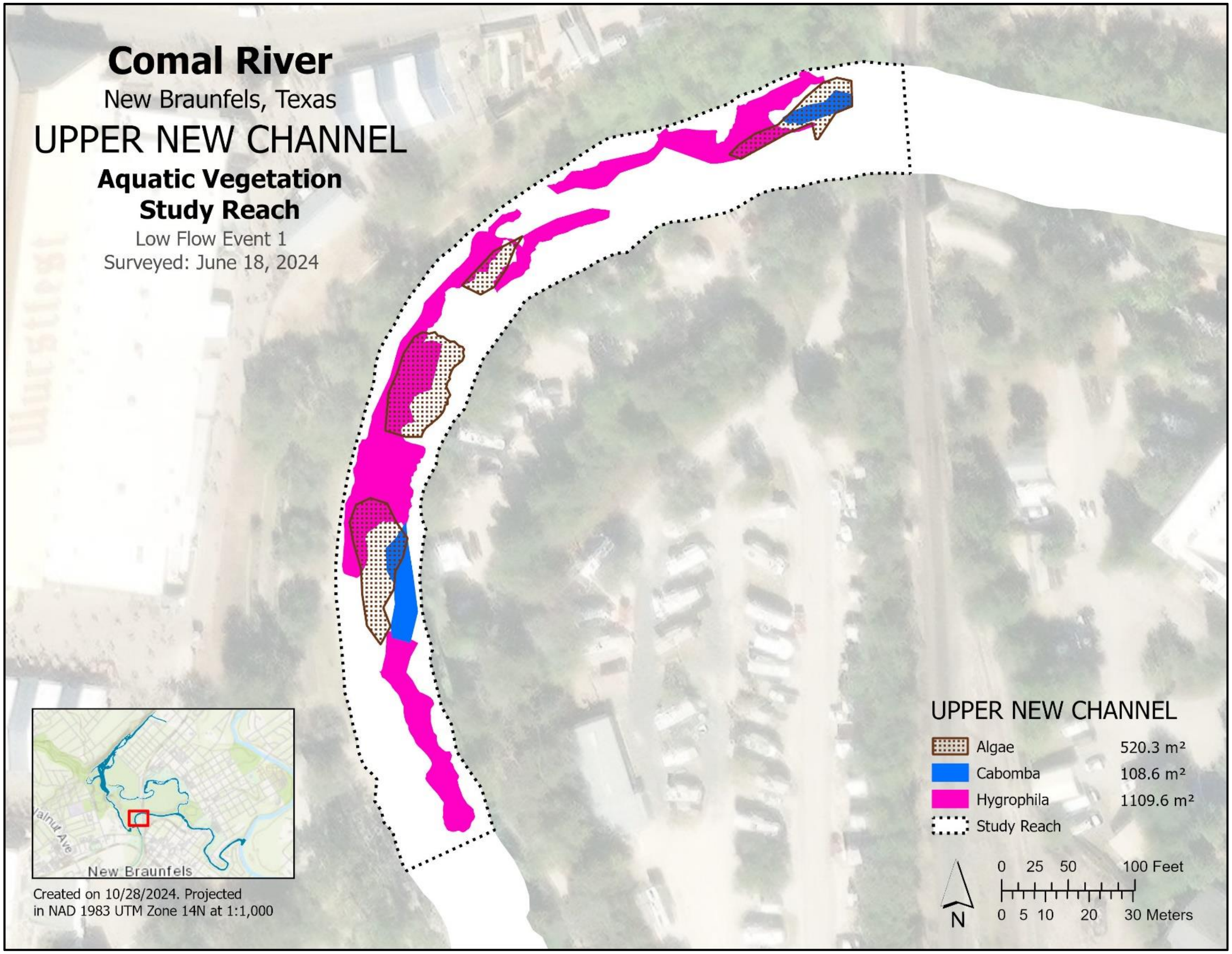

Figure C14. Map of aquatic vegetation coverage at Upper New Channel in summer 2024 during the first Critical Period low-flow sampling event (June).

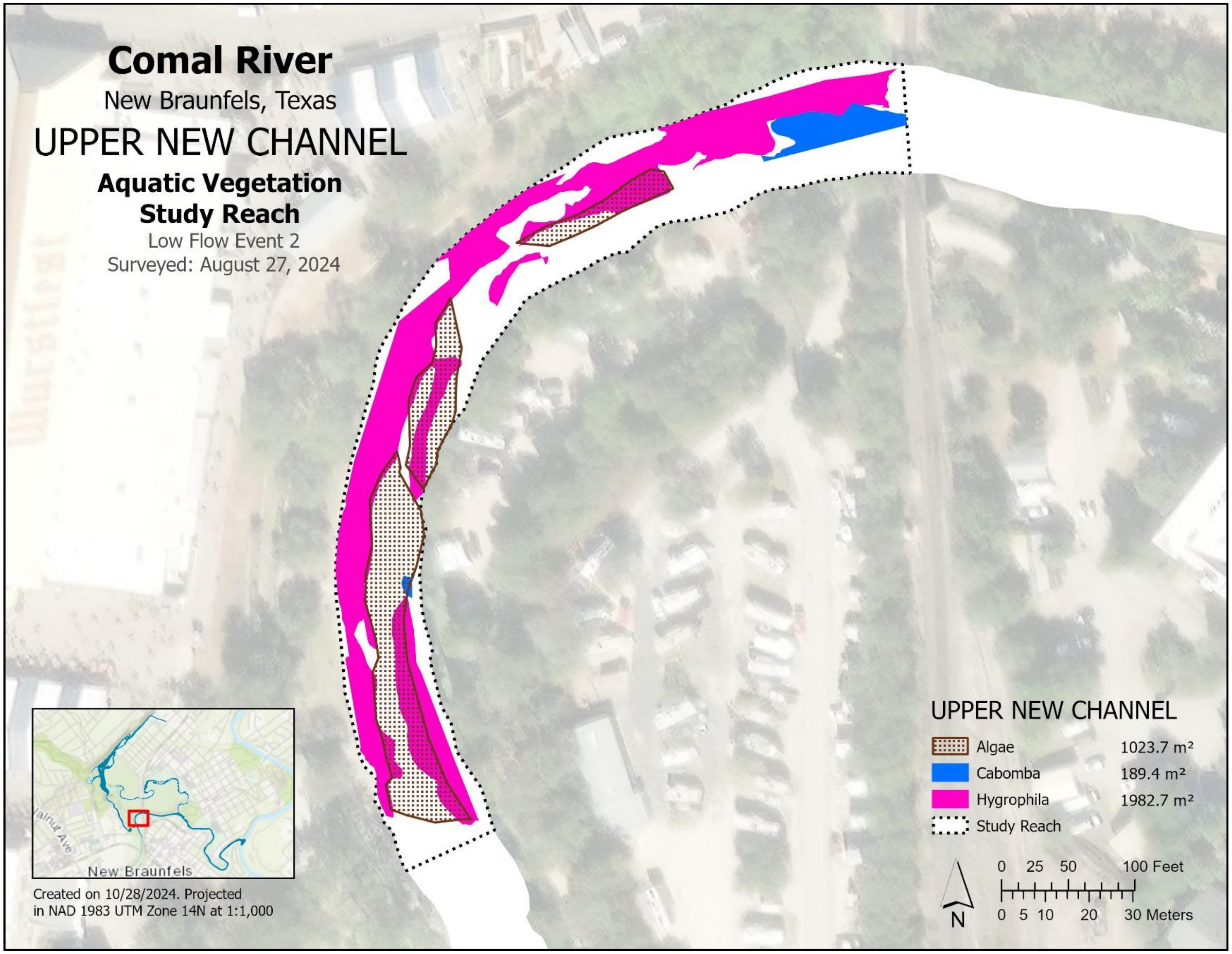

Figure C15. Map of aquatic vegetation coverage at Upper New Channel Study Reach in summer 2024 during the second low-flow sampling event (August).

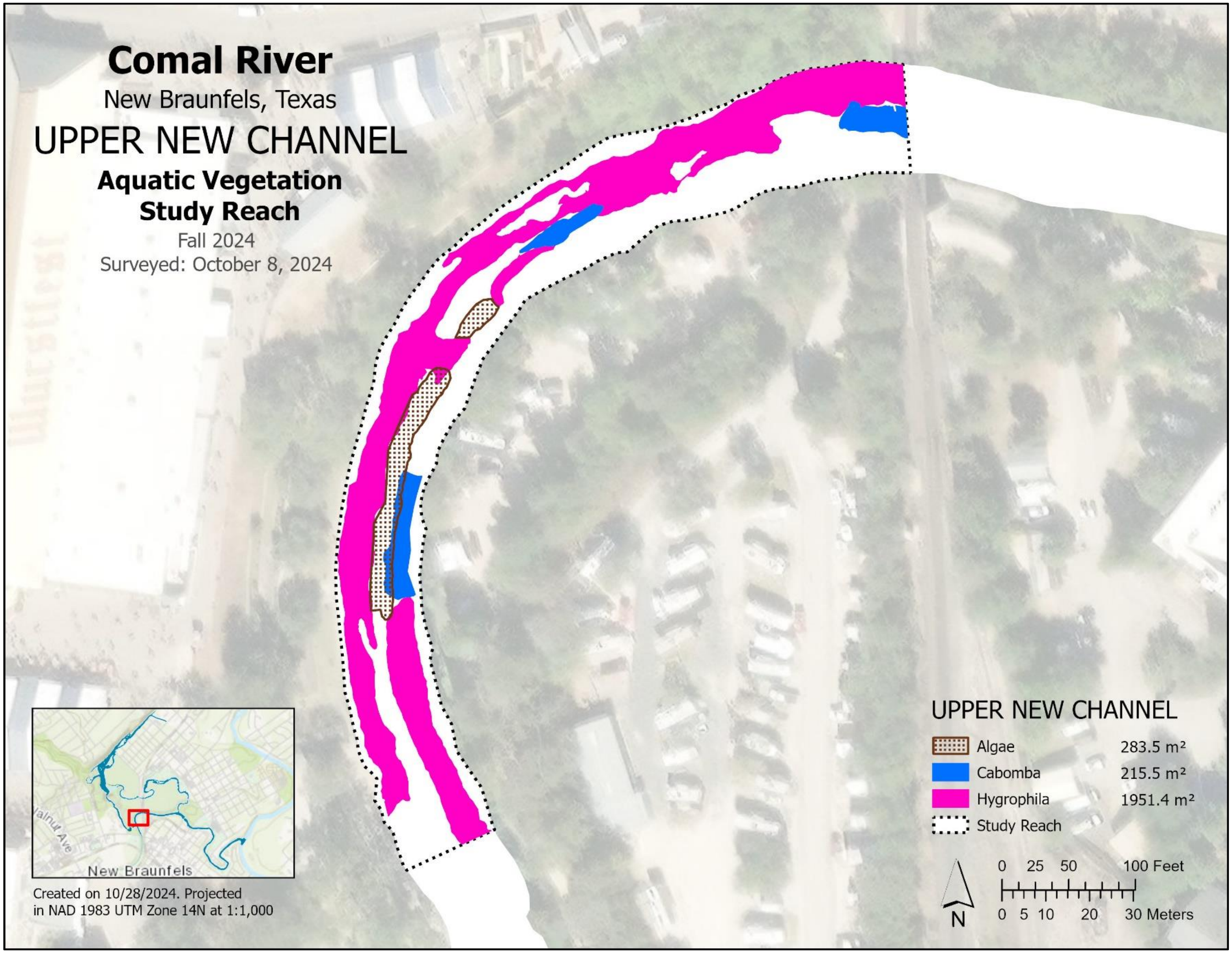

Figure C16. Map of aquatic vegetation coverage at Upper New Channel Study Reach in fall 2024.

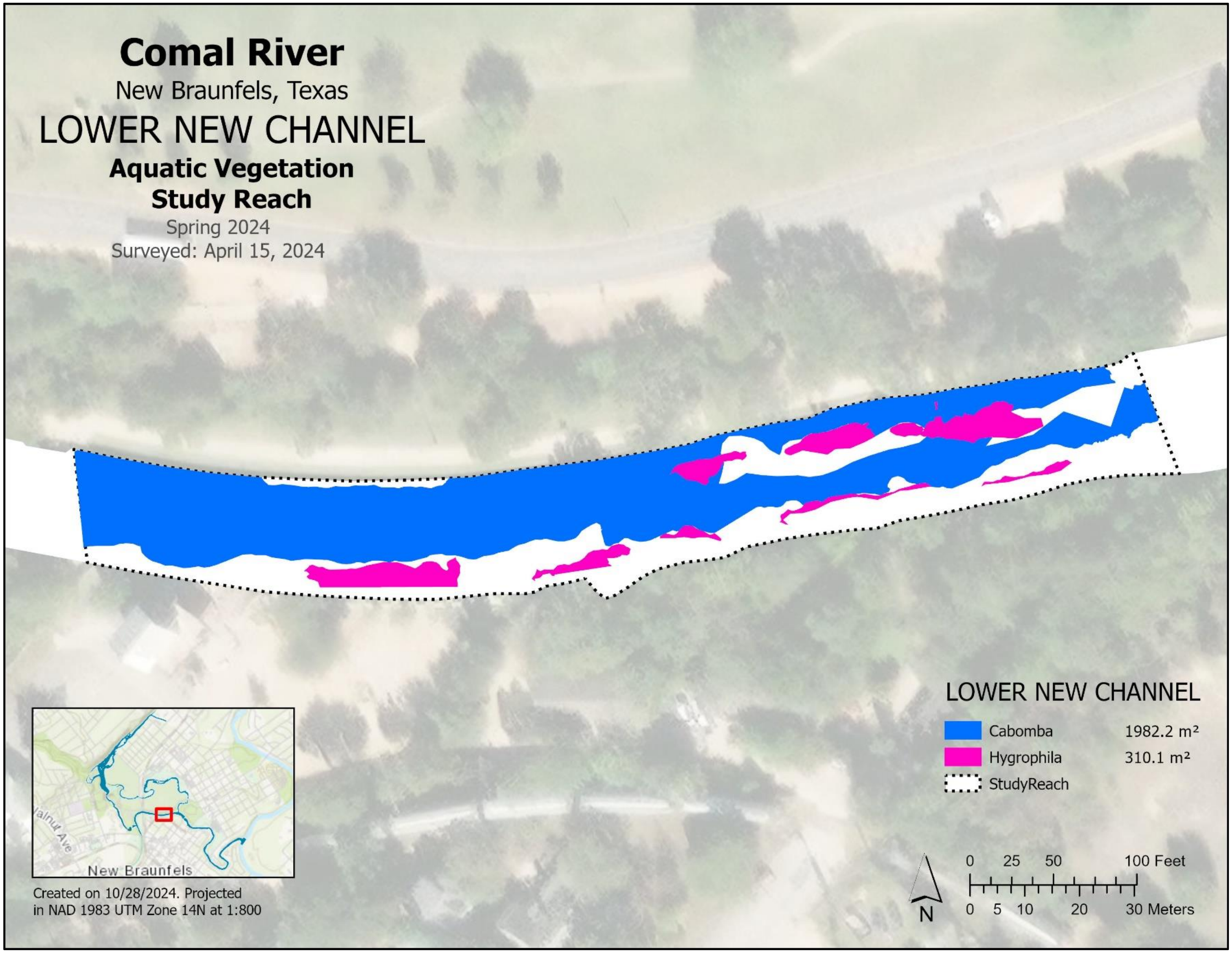

Figure C17. Map of aquatic vegetation coverage at Lower New Channel Study Reach in spring 2024.

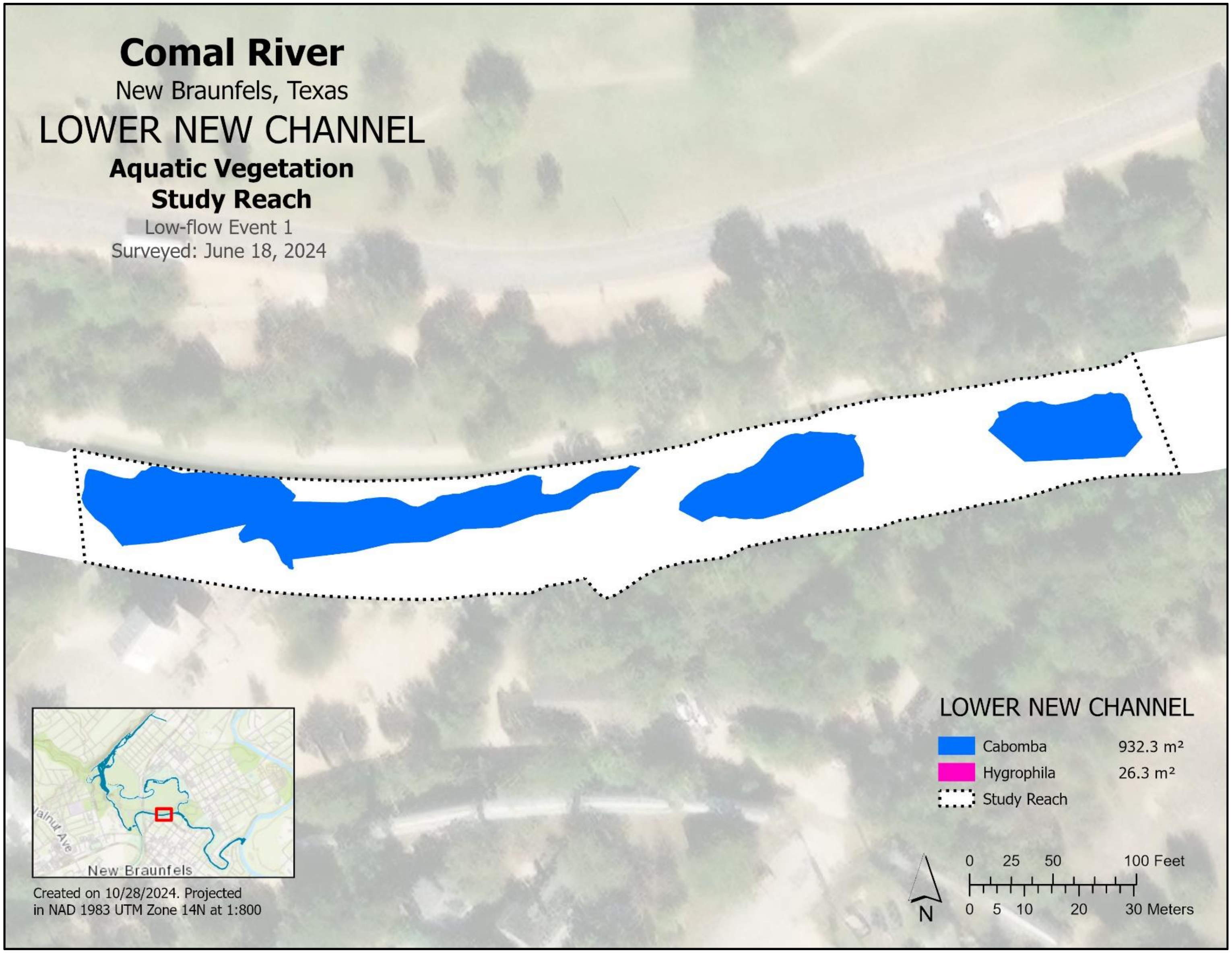

Figure C18. Map of aquatic vegetation coverage at Lower New Channel in summer 2024 during the first Critical Period low-flow sampling event (June).

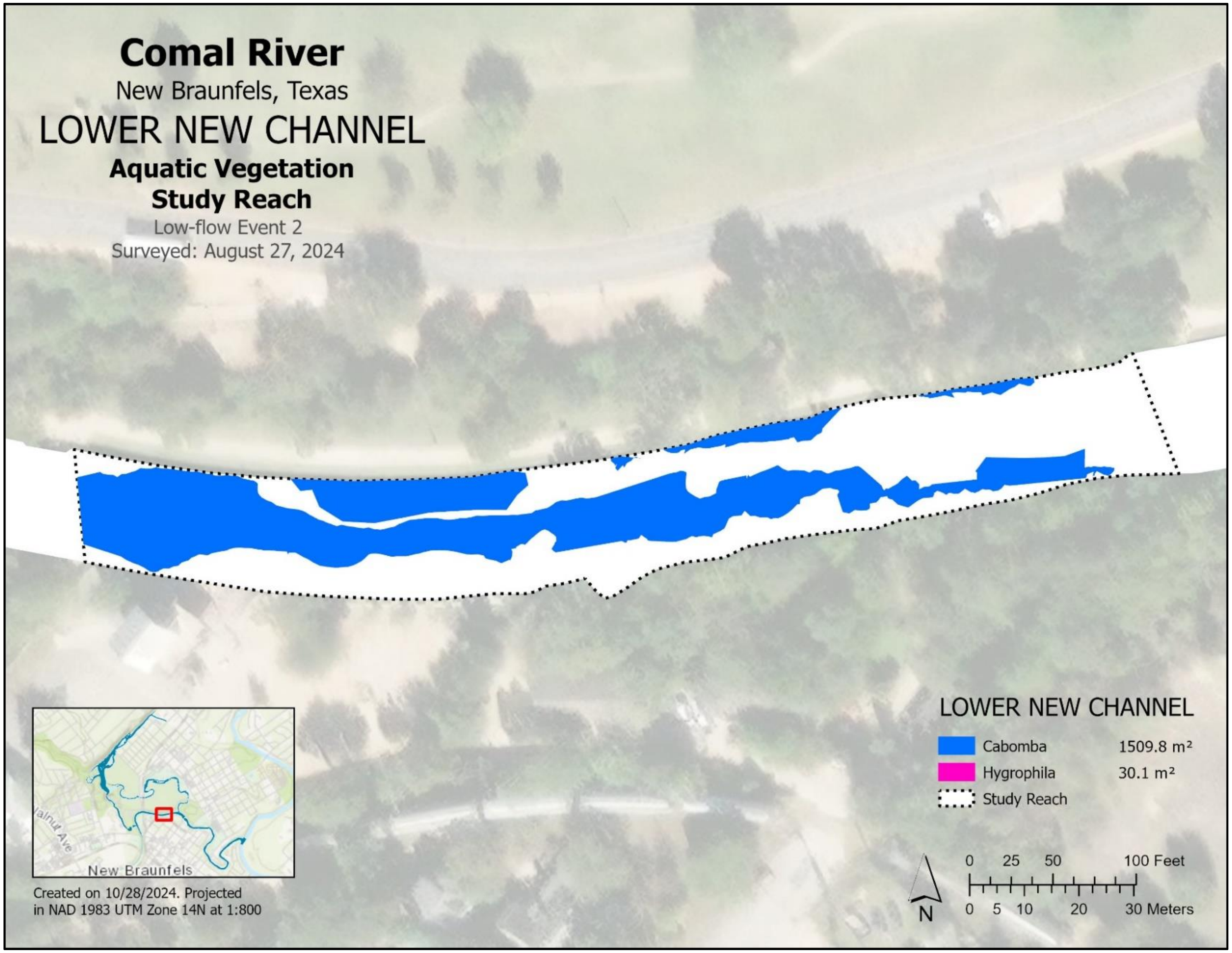

Figure C19. Map of aquatic vegetation coverage at Lower New Channel Study Reach in summer 2024 during the second low-flow sampling event (August).

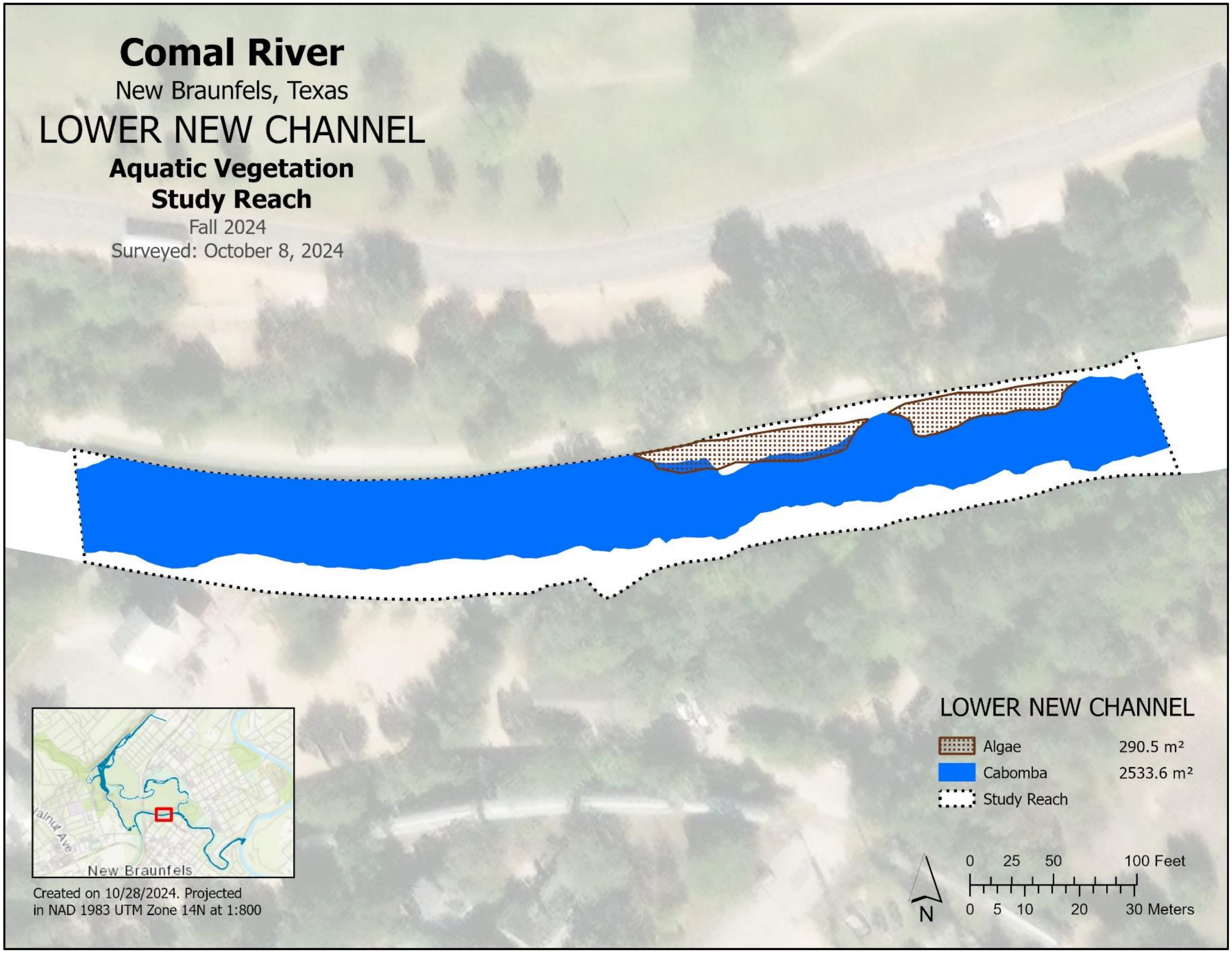

Figure C20. Map of aquatic vegetation coverage at Lower New Channel Study Reach in fall 2024.

APPENDIX D: TEXAS MASTER NATURALIST MONITORING RESULTS

Site locations are shown in Figure 2 of the report and are listed from upstream (Houston Street) to downstream (Union Avenue). Water quality data collected by Master Naturalist volunteers in 2024 were similar to previous years, observing CO2 concentrations highest at sites near springs, such as the Houston Street (Upper Spring Run Reach) and Gazebo (Landa Lake/Spring Run 3) sample sites (Figure D1). Also continuing with past observations, pH measurements increased with increased distance from the springs (Figure D2). The inverse relationship between CO2 and pH is directly related to greater concentrations of carbonic acid in spring waters. As CO2 concentrations decline going downstream, pH rises in the system. Within sites, year-to-year variation was relatively limited in both pH and CO2 concentrations.

To compare recreational use at the various sites, weekly counts of recreation users collected by the Texas Master Naturalist volunteers were converted to monthly averages and plotted over a long-term survey period (Figures D3–D7). In 2024, the New Channel continued as the most recreated area in the system. Recreation was second highest at Union Avenue, though levels were much lower than during previous years and those observed at the New Channel site. As in previous years, recreational use at Elizabeth Street (Old Channel) was low because this site is not located within a city park or advertised for recreational use (Figures D3–D7).

The New Channel site has received the most recreation pressure throughout the Texas Master Naturalist monitoring (2006–2024). The peak of recreational use is usually during the summer months of June through September (Figure D6). During the warmer months, the New Channel site becomes a popular destination for tubers and others seeking relief from the heat in the cooler spring-fed water. There was a brief decrease in activity during the lockdowns associated with the COVID-19 pandemic in 2020; however, activity at the New Channel site has returned to levels similar to historical trends in 2024. Much like the New Channel site, recreation pressure at the Union Avenue site can also be substantial during summer because this is a take-out site for many tubers floating the river (Figure D7), however, a marked decrease in recreation compared to 2023 was observed in 2024. A possible explanation for this could be due to reduced flows.

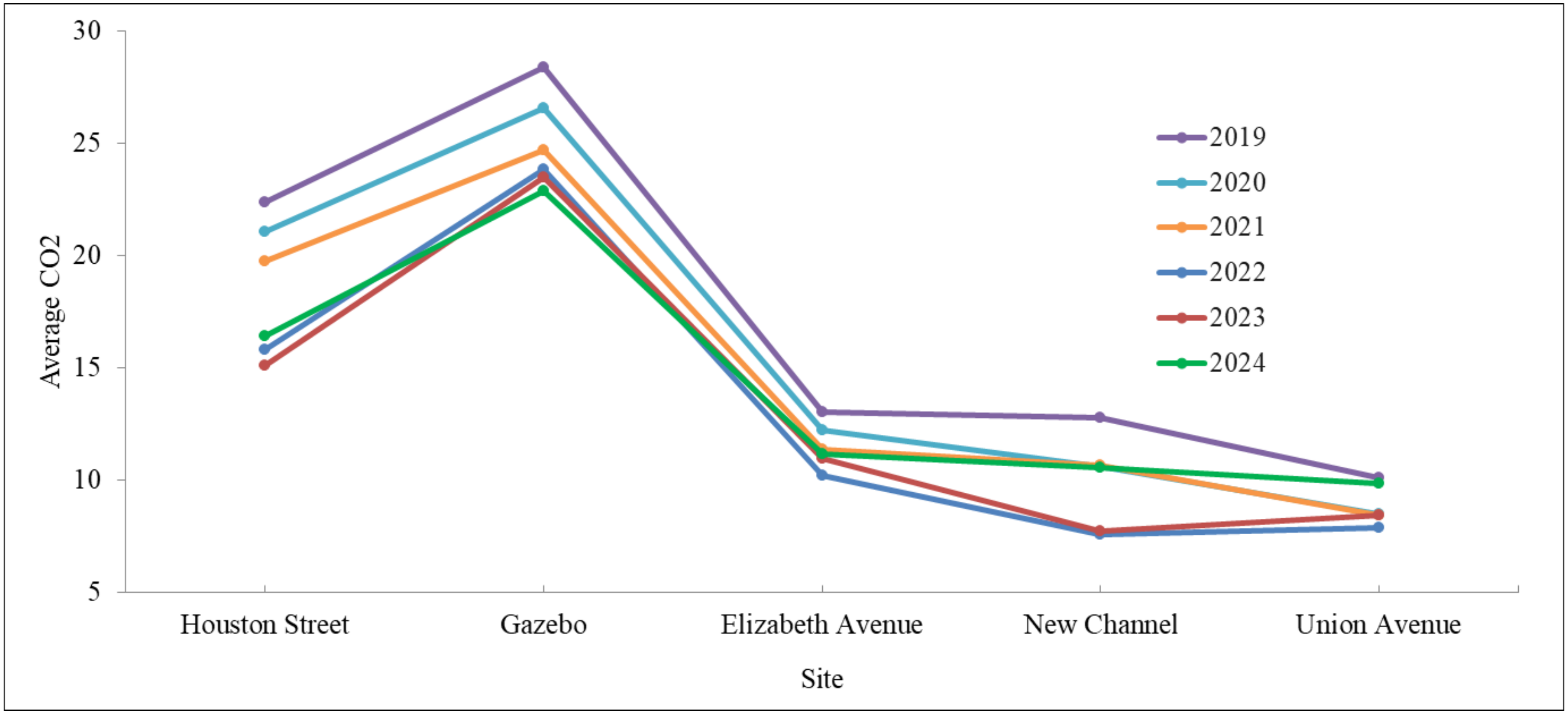

Figure D1. **Annual average dissolved carbon dioxide (CO_2) concentrations at five sites on the Comal River system (2019–2024).**

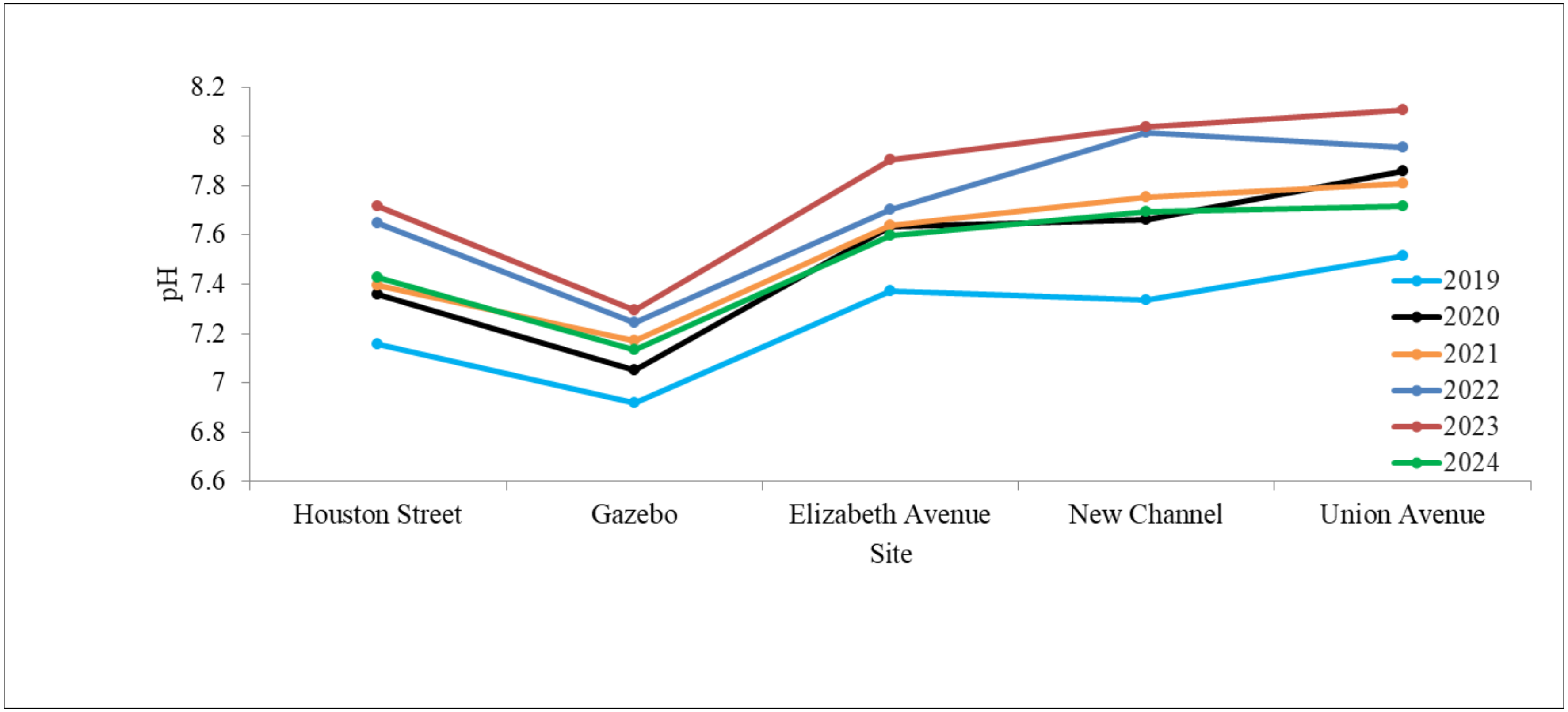

Figure D2. **Annual average pH values at five sites on the Comal River system (2019–2024).**

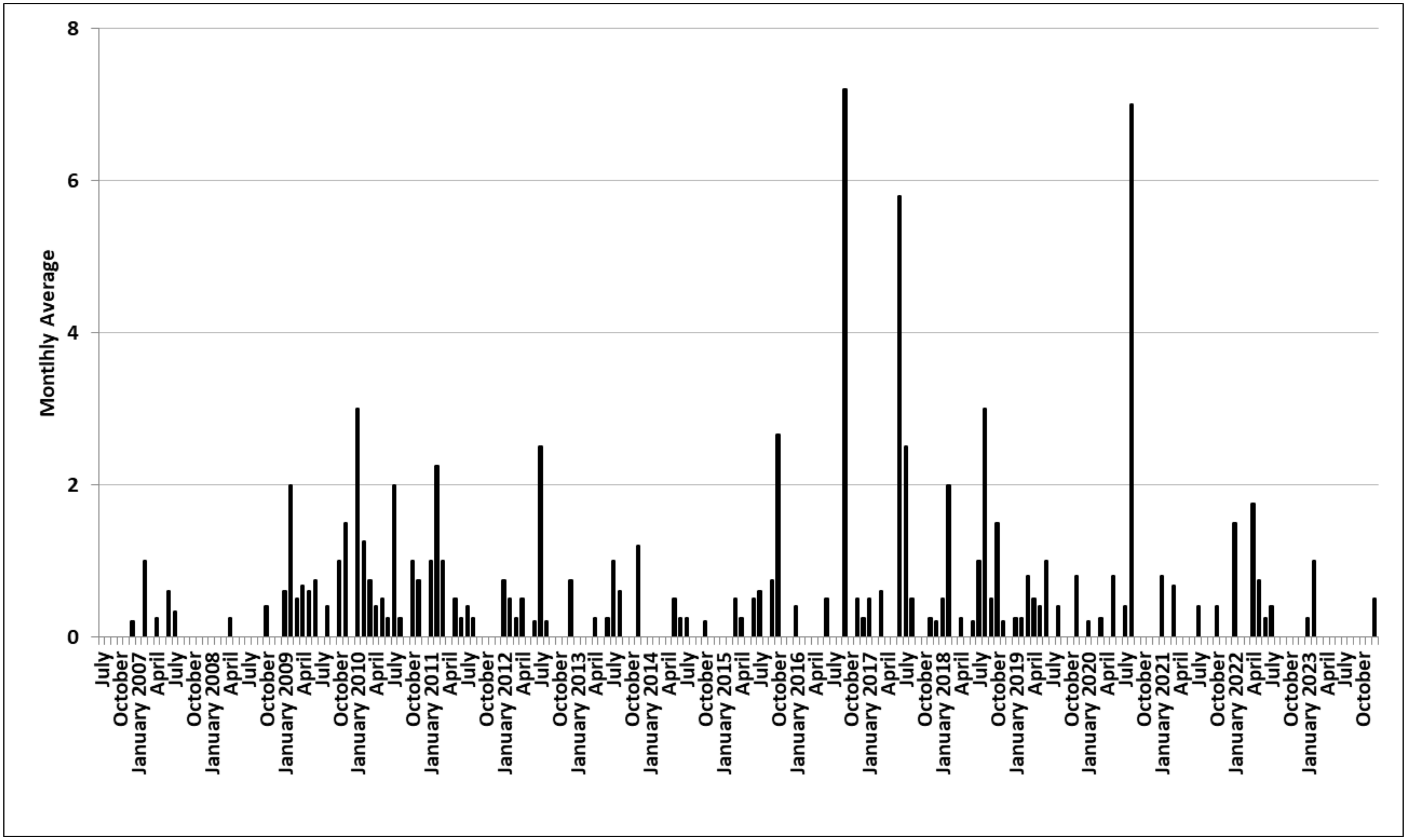

Figure D3. **Average daily recreational user counts at the Elizabeth Avenue site (2006–2024).**

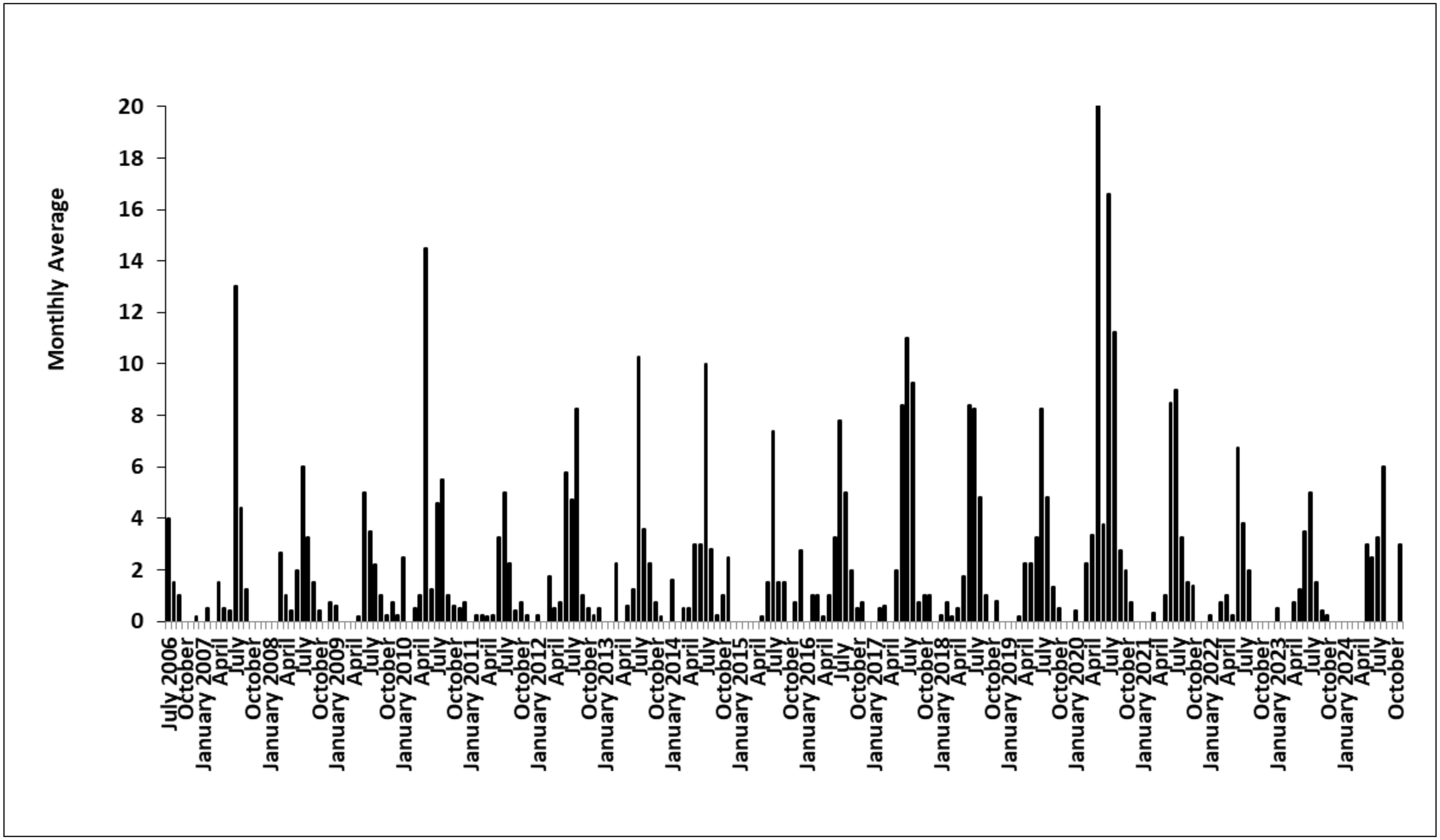

Figure D4. **Average daily recreational user counts at the Upper Spring Run site (2006–2024).**

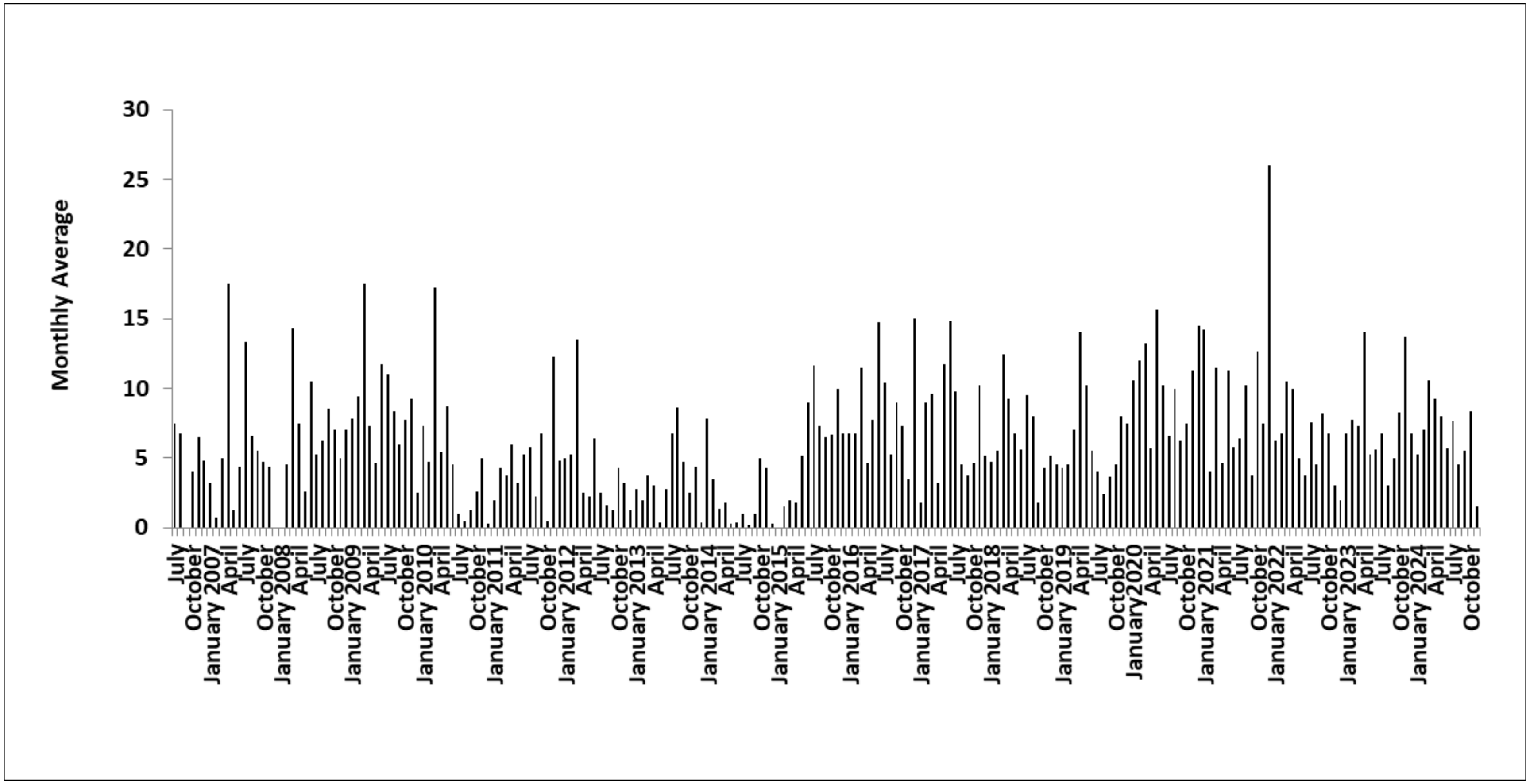

Figure D5. **Average daily user counts at the Landa Lake Park Gazebo site (2006–2024).**

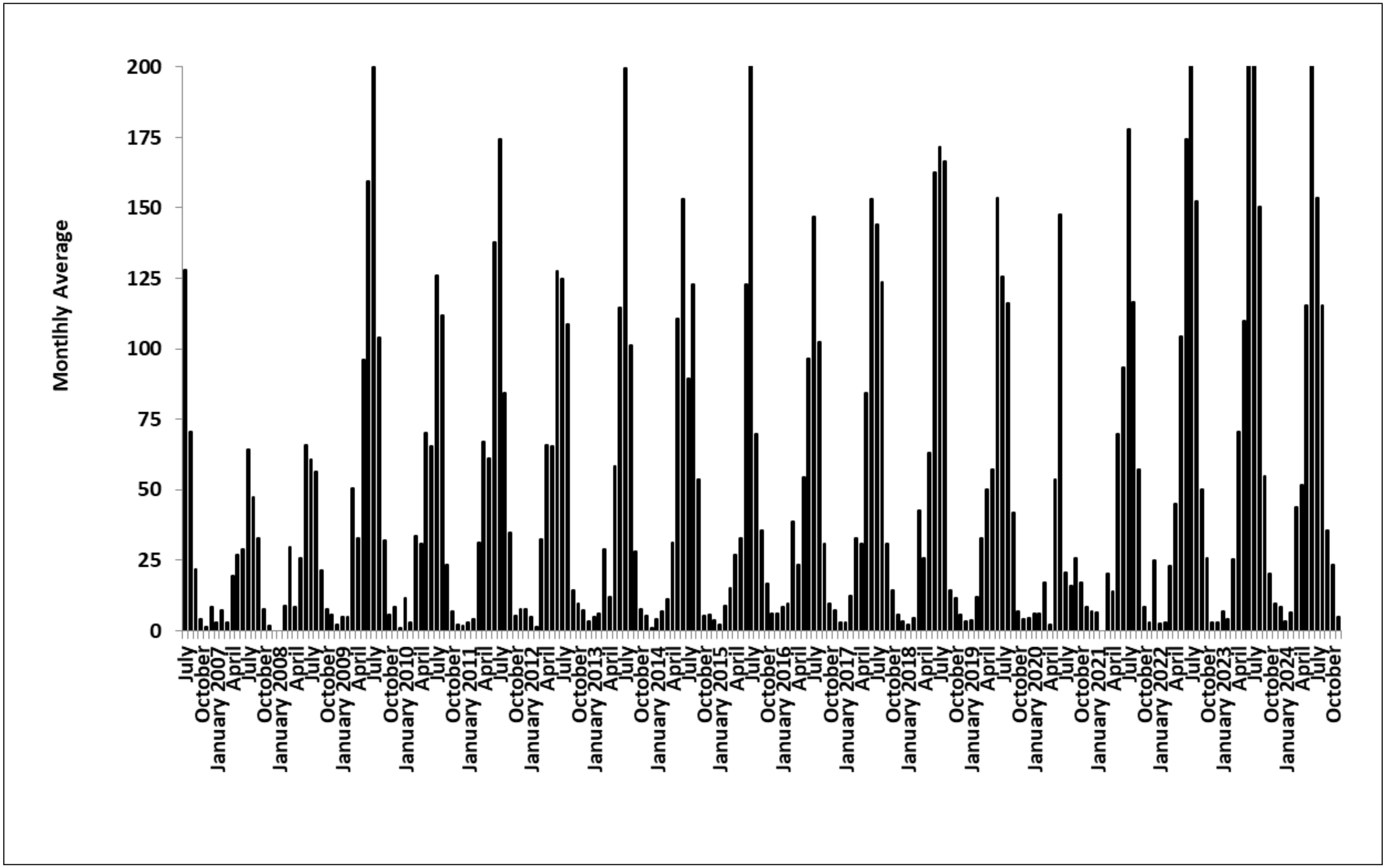

Figure D6. **Average daily user counts at the New Channel site (2006-2024).**

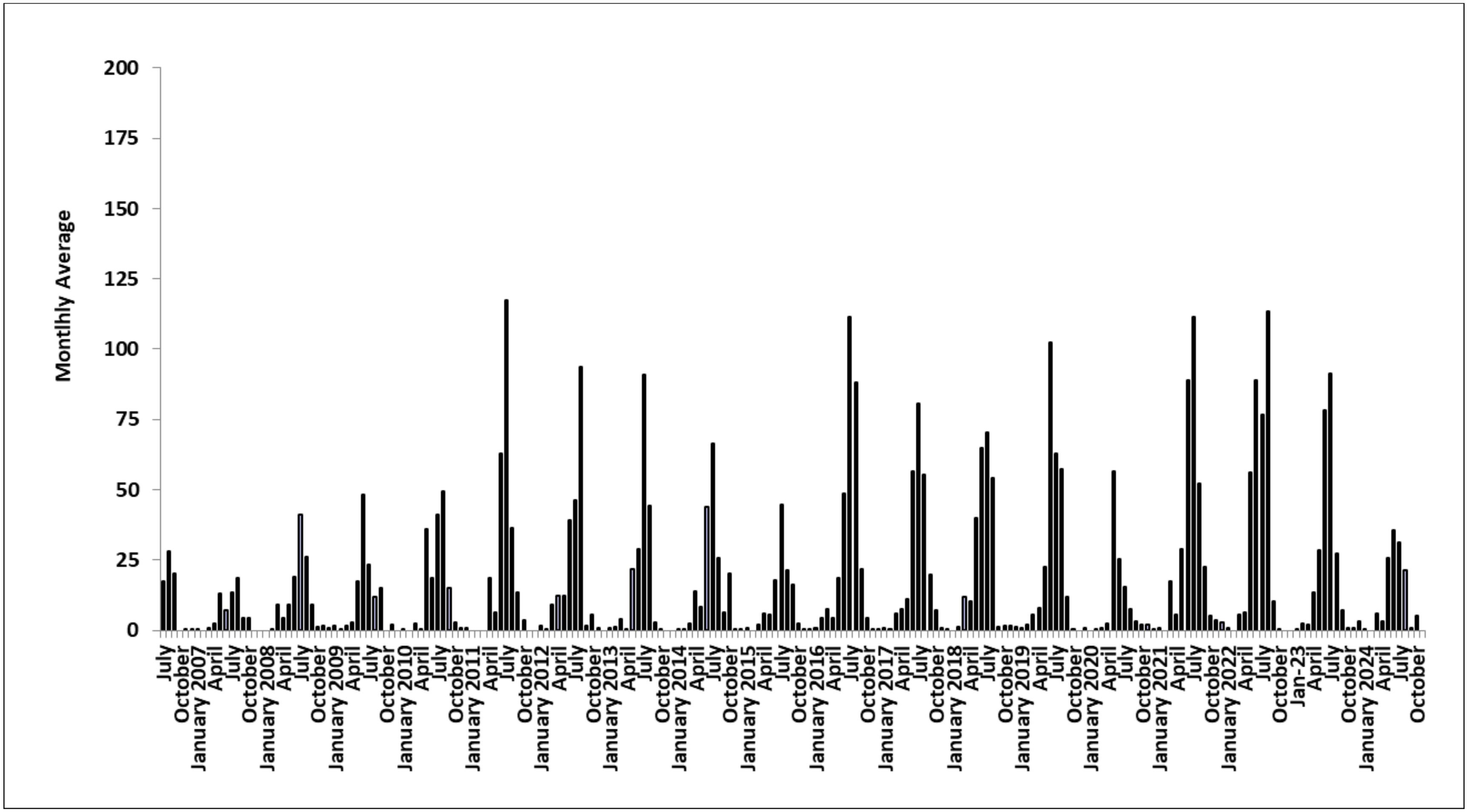

Figure D7. **Average daily recreational user counts at the Union Avenue site (2006–2024).**

APPENDIX E: TABLES AND FIGURES

TABLES

Fish Assemblage Results:
Drop-Net and Fish Community Sampling

Table E1. **Overall number (#) and percent relative abundance (%) of fishes collected from the three long-term biological goals study reaches during drop-net sampling in 2024.**

TAXA	UPPER SPRING RUN		LANDA LAKE		OLD CHANNEL		NEW CHANNEL	
	#	%	#	%	#	%	#	%
Leuciscidae								
Dionda nigrotaeniata	72	17.73	68	3.71	2	0.37	3	0.45
Notropis amabilis	0	0.00	0	0.00	64	11.74	0	0.00
Paranotropis volucellus	0	0.00	0	0.00	1	0.18	0	0.00
Characidae								
*Astyanax argentatus**	41	10.10	71	3.87	1	0.18	4	0.61
Ictaluridae								
Ameiurus natalis	0	0.00	10	0.55	2	0.37	2	0.30
Poeciliidae								
Gambusia sp.	24	5.91	52	2.84	3	0.55	4	0.61
Poecilia latipinna	0	0.00	0	0.00	0	0.00	1	0.15
Centrarchidae								
*Ambloplites rupestris**	0	0.00	0	0.00	0	0.00	5	0.76
Lepomis cyanellus	0	0.00	0	0.00	1	0.18	90	13.64
Lepomis gulosus	0	0.00	0	0.00	0	0.00	21	3.18
Lepomis miniatus	76	18.72	116	6.32	10	1.83	28	4.24
Lepomis sp.	32	7.88	23	1.25	245	44.95	4	0.61
Micropterus salmoides	33	8.13	10	0.55	0	0.00	5	0.76
Percidae								
Etheostoma fonticola	102	25.12	1482	80.81	207	37.98	44	6.67
Etheostoma lepidum	10	2.46	0	0.00	0	0.00	0	0.00
Cichlidae								
*Herichthys cyanoguttatus**	16	3.94	2	0.11	9	1.65	449	68.03
TOTAL	**406**		**1834**		**545**		**660**	

Asterisks (*) denotes introduced species

Table E2. Overall number (#) and percent relative abundance (%) of fishes collected during fish community sampling in 2024.

TAXA	Upper Spring Run #	Upper Spring Run %	Landa Lake #	Landa Lake %	Old Channel #	Old Channel %	New Channel #	New Channel %
Leuciscidae								
Cyprinella lutrensis	0	0.0	0	0.0	1	0.1	0	0.0
Cyprinella venusta	0	0.0	0	0.0	0	0.0	1	0.0
Dionda nigrotaeniata	2490	57.2	3630	57.1	53	4.1	175	7.8
Notropis amabilis	101	2.3	10	0.2	35	2.7	8	0.4
Paranotropis volucellus	0	0.0	0	0.0	19	1.5	1	0.0
Characidae								
*Astyanax argentatus**	204	4.7	1471	23.1	313	24.0	359	16.1
Ictaluridae								
Ameiurus natalis	1	0.0	0	0.0	0	0.0	3	0.1
Ictaluris punctatus	0	0.0	0	0.0	1	0.1	0	0.0
Loricariidae								
Loricariidae sp.	0	0.0	0	0.0	6	0.5	0	0.0
Poeciliidae								
Gambusia affinis	22	0.5	0	0.0	29	2.2	394	17.6
Gambusia geiseri	22	0.5	0	0.0	76	5.8	220	9.8
Gambusia sp.	115	2.6	235	3.7	269	20.6	133	6.0
*Poecilia latipinna**	1	0.0	110	1.7	0	0.0	144	6.4
Centrarchidae								
*Ambloplites rupestris**	0	0.0	0	0.0	1	0.1	0	0.0
*Lepomis auritus**	24	0.6	7	0.1	44	3.4	84	3.8
Lepomis cyanellus	0	0.0	0	0.0	0	0.0	3	0.1
Lepomis gulosus	0	0.0	0	0.0	0	0.0	12	0.5
Lepomis macrochirus	13	0.3	0	0.0	3	0.2	0	0.0
Lepomis megalotis	5	0.1	0	0.0	1	0.1	16	0.7
Lepomis microlophus	0	0.0	3	0.0	0	0.0	0	0.0
Lepomis miniatus	160	3.7	2	0.0	42	3.2	90	4.0
Lepomis sp.	14	0.3	63	1.0	115	8.8	67	3.0
Micropterus salmoides	389	8.9	249	3.9	43	3.3	71	3.2
Micropterus sp.	21	0.5	0	0.0	0	0.0	2	0.1
Percidae								
Etheostoma fonticola	261	6.0	326	5.1	132	10.1	165	7.4
Etheostoma lepidum	140	3.2	79	1.2	38	2.9	45	2.0
Etheostoma sp.	221	5.1	159	2.5	11	0.8	66	3.0
Cichlidae								
*Herichthys cyanoguttatus**	132	3.0	6	0.1	72	5.5	176	7.9

Oreochromis aureus	15	0.3	10	0.2	2	0.2	0	0.0
Total	**4,351**		**6,360**		**1,306**		**2,235**	

Asterisks (*) denotes introduced species

Table E3. **Total numbers of stygobitic and endangered species collected at each site (24 hours per event) during spring and fall 2024. Federally endangered species are designated with (E). A = adults; L = larvae.**

TAXA	RUN 1	RUN 3	UPWELLING	TOTAL
Crustaceans				
Amphipoda				
Crangonyctidae				
Stygobromus pecki (E)			15	15
Stygobromus russelli				0
Stygobromus bifurcatus				0
Stygobromus flagellatus				0
Stygobromus spp.	3	15	180	198
All *Stygobromus*	3	15	195	213
Hadziidae				
Mexiweckelia hardeni	2	4	1	7
Sebidae				
Seborgia relicta		2	3	5
Bogidiellidae				
Artesia subterranea				0
Parabogidiella americana				0
Ingolfiellidae				
Ingolfiella n. sp				0
Isopoda				
Asellidae				
Lirceolus spp.	2	51	8	61
Cirolanidae				
Cirolanides texensis			1	1
Cirolanides wassenichae				0
Microceberidae				
Texicerberus sp.				0
Ostracoda				

Candonidae				
Cavernocypris sp.			5	5
Comalcandona tressleri	5	7	11	23
Comalcandona gibsoni	7	2		9
Rugosuscandona scharfi	4			4
Lacromacanadona sp.?	1			1
Ufocandona hannaleeae				0
Thermosbaenacea				
Monodellidae				
Tethysbaena texana				0
Bathynellacea				
Parabathynellidae				
Texanobathynella bowmani				0
Bathynellidae				
Hobbsinella edwardensis				0
Turbellaria				
Kenkiidae				
Sphalloplana mohri	1		0	1
Mollusca				
Gastropda				
Cochliopidae				
Phreatodrobia micra			2	2
Phreatodrobia nugax				0
Phreatodrobia plana		1	4	5
Phreatodrobia rotunda		1		1
Phreatodrobia spica		2	2	4
Vitropyrgus lillianae	1	34	1	36
Annelids				
Lumbriculata				
Lumbriculidae				
Eremidrilus sp.		4	0	4

Haplotaxis sp.				0
<u>Arachnids</u>				
Hydrachnoidea				
Hydryphantidae				
Almuerzothyas comalensis	2	2	2	6
<u>Insects</u>				
Coleoptera				
Dytiscidae				
Comaldessus stygius	1(adult)			1
Haideoporus texanus				0
Dryopidae				
Stygoparnus comalensis (E)				0
Elmidae				
Heterelmis comalensis (E)	1 (larva)			1

FIGURES

Springflow: M9 Measurements

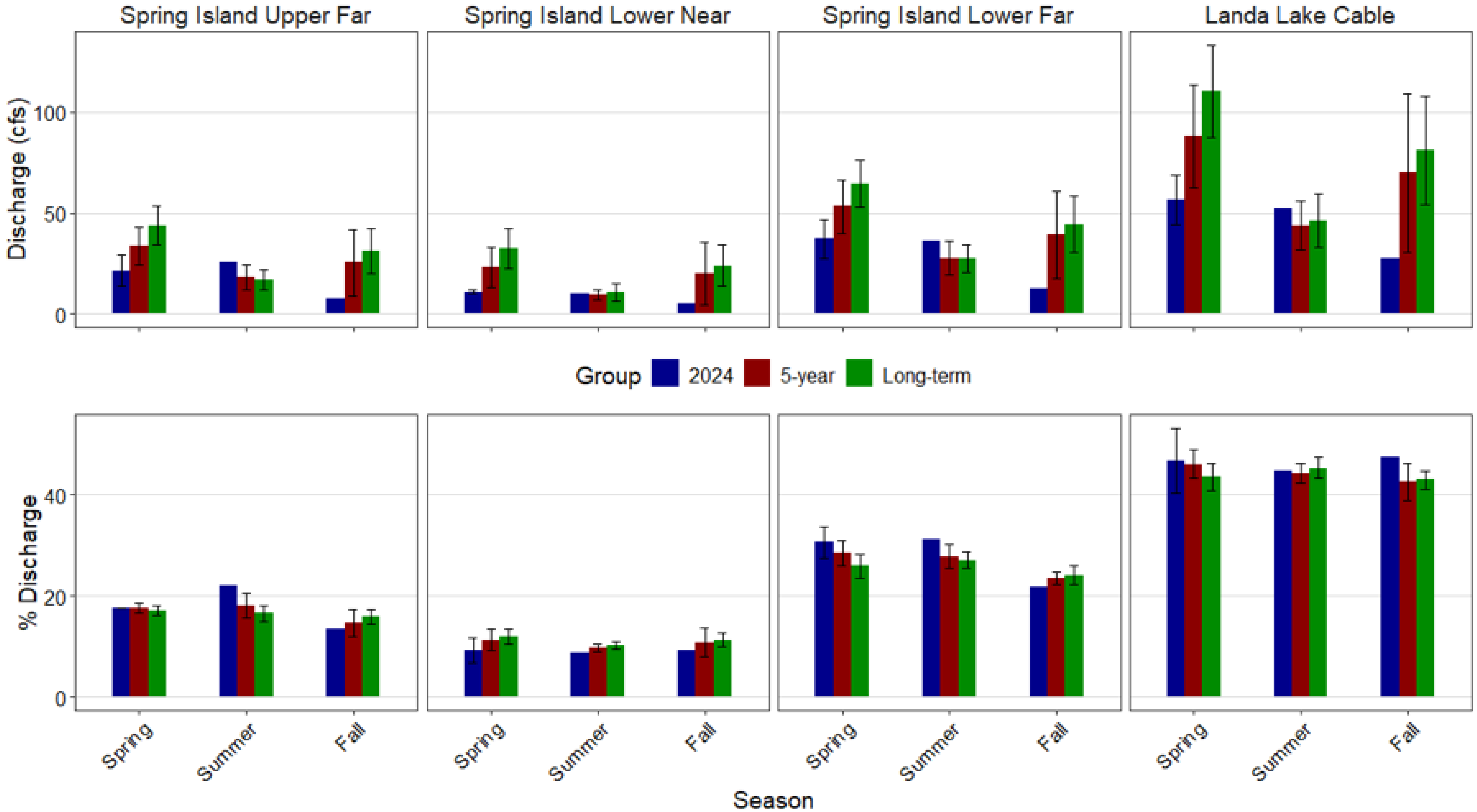

Figure E1. **Current (blue bars), five-year (2020–2024; red bars), and long-term (2014–2024; green bars) discharge and percent total discharge based on spring and fall M9 measurements in the Comal Springs/River. Five-year and long-term values are represented as means and error bars denote 95% confidence intervals.**

Aquatic Vegetation

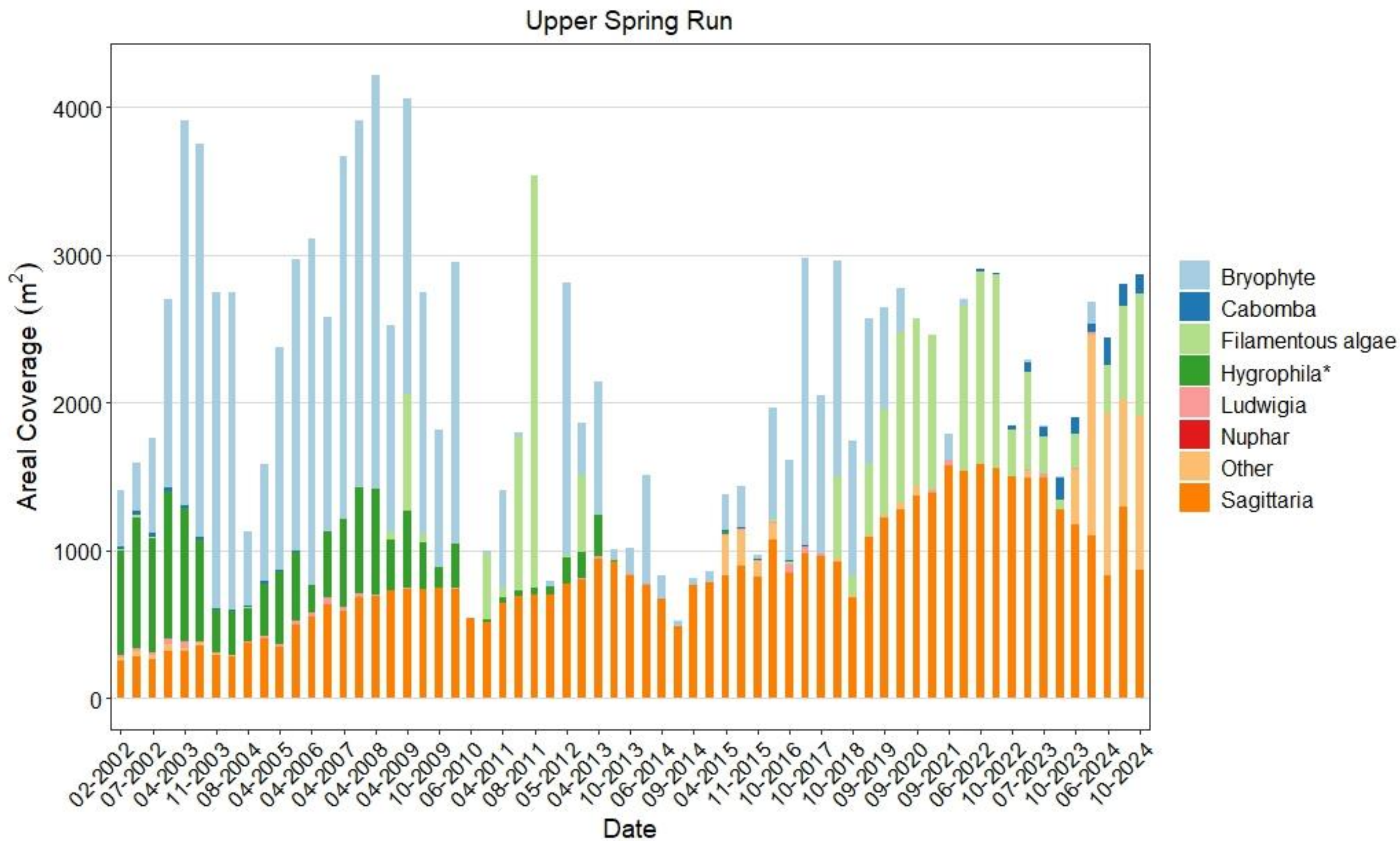

Figure E2. **Aquatic vegetation composition (m^2) among select taxa from 2002–2024 at the Upper Spring Run.**

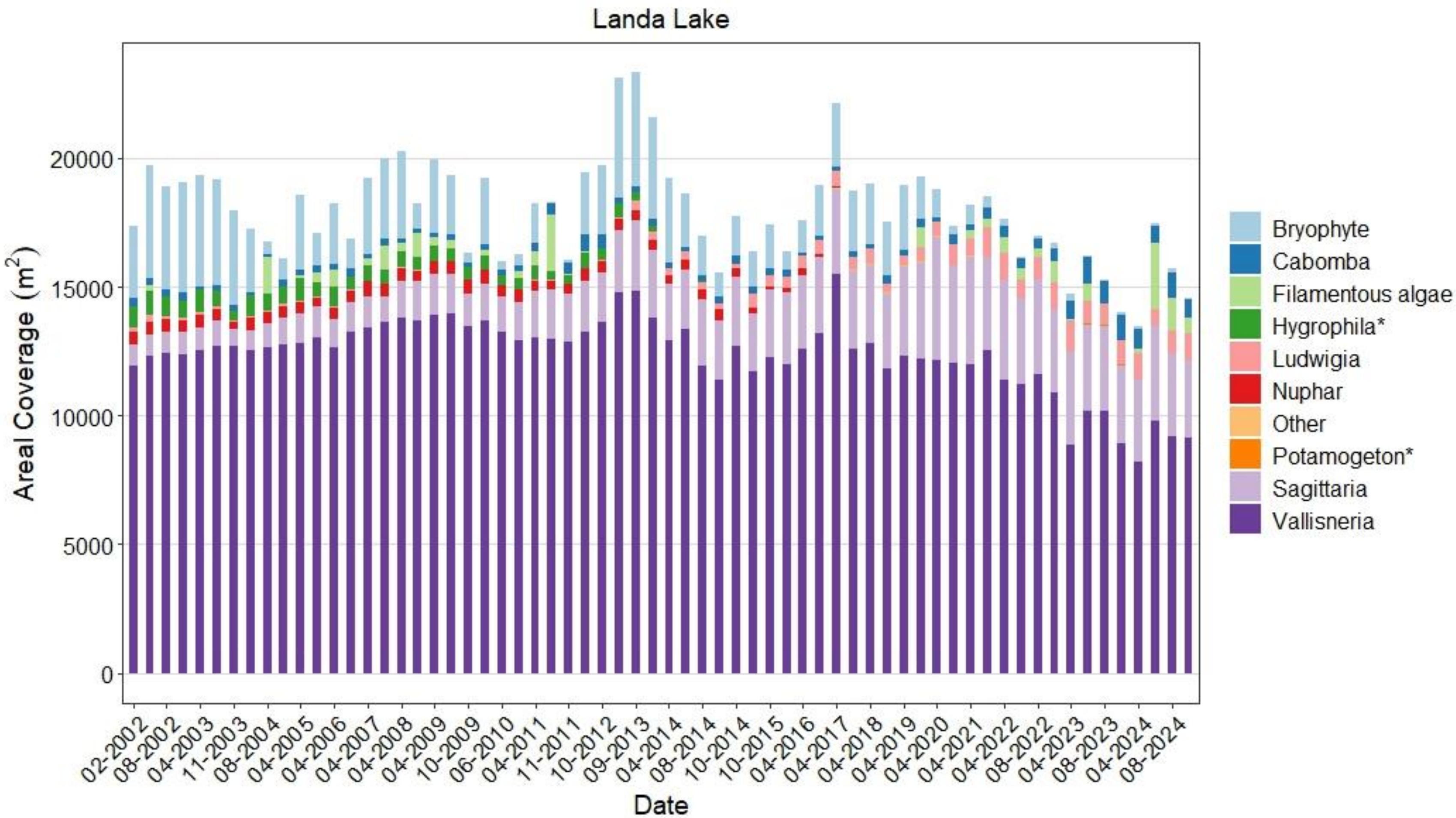

Figure E3. **Aquatic vegetation composition (m^2) among select taxa from 2002–2024 at Landa Lake.**

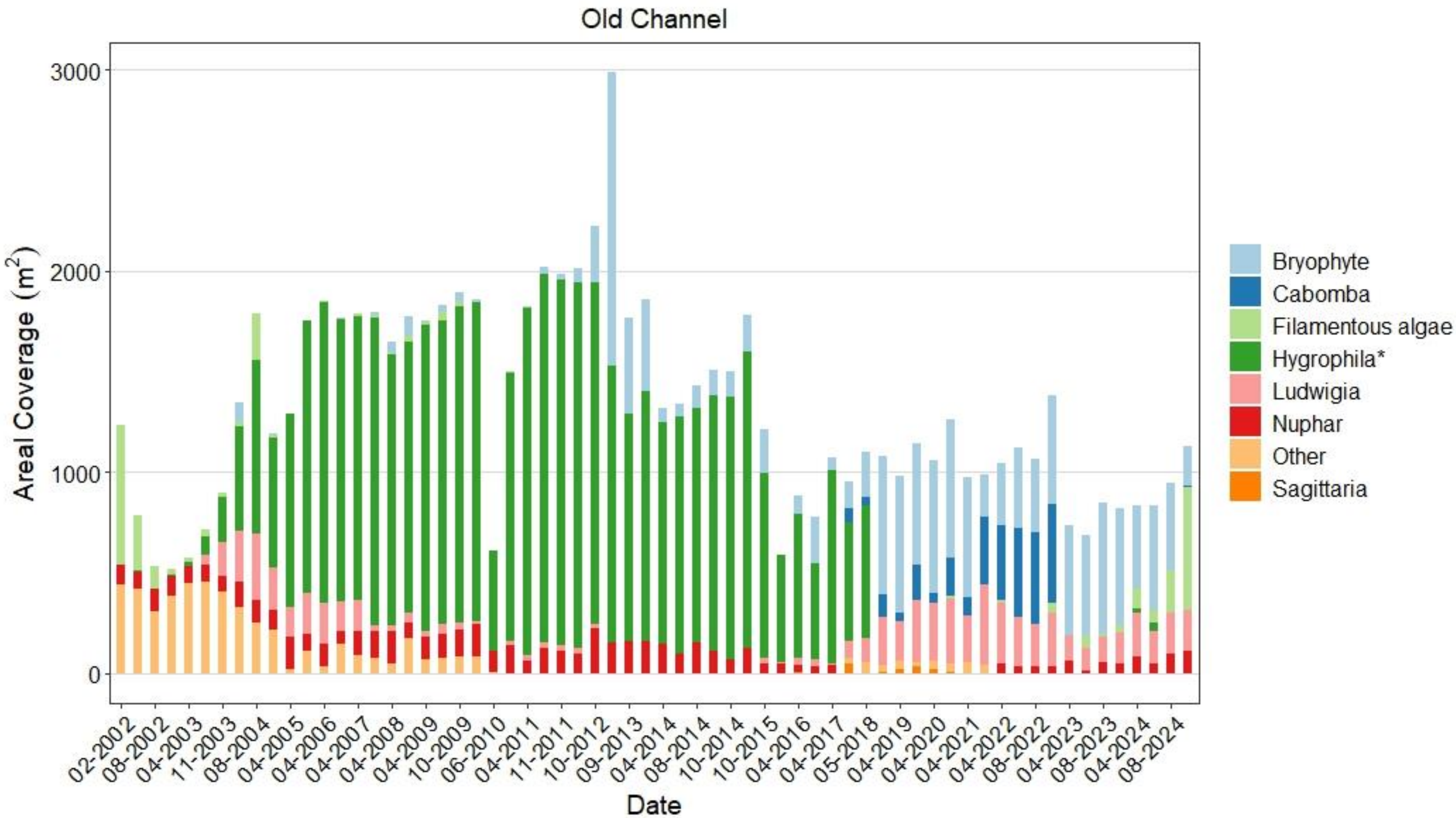

Figure E4. Aquatic vegetation composition (m^2) among select taxa from 2002–2024 at the Old Channel.

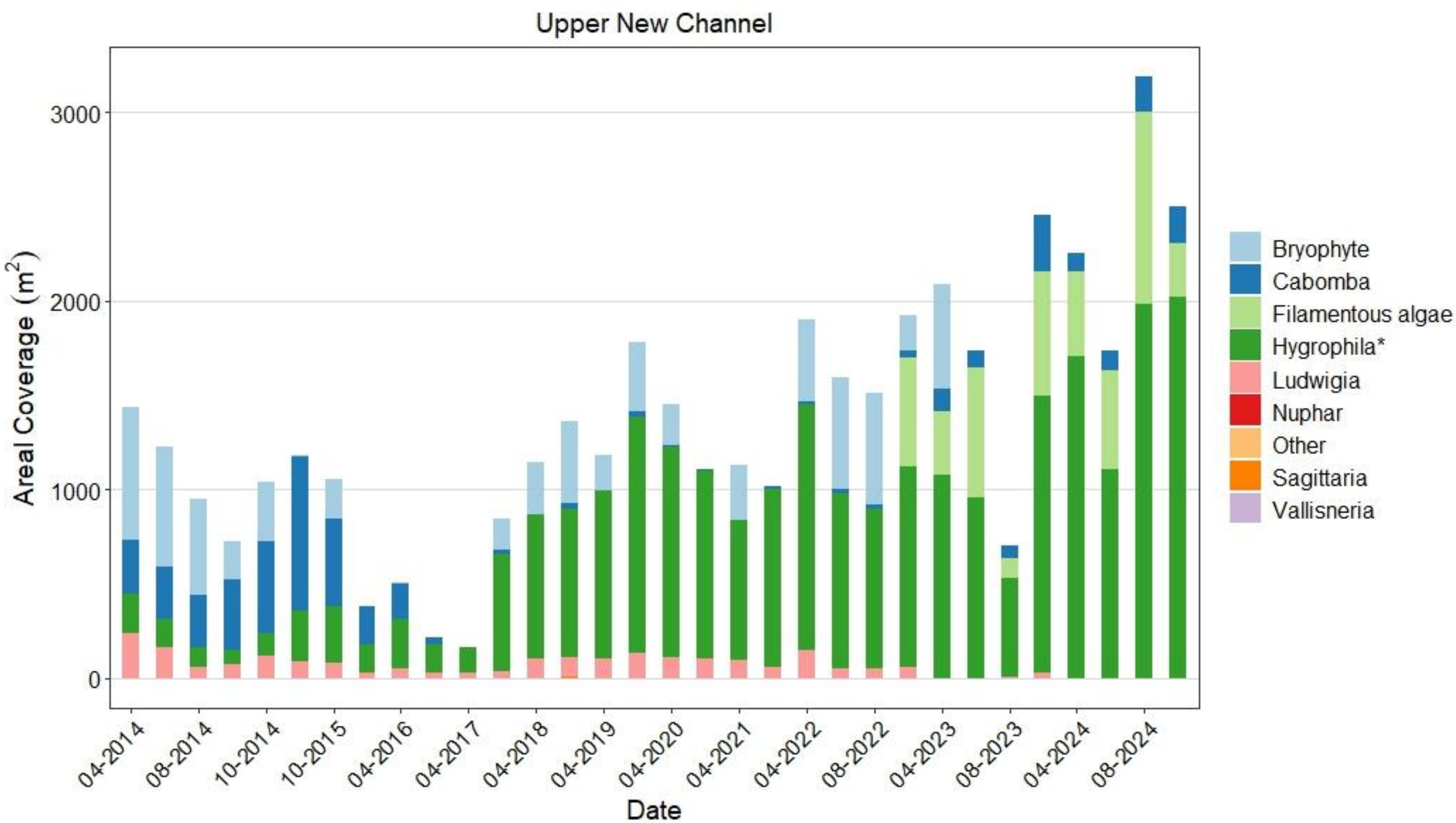

Figure E5. **Aquatic vegetation composition (m^2) among select taxa from 2014–2024 at the Upper New Channel.**

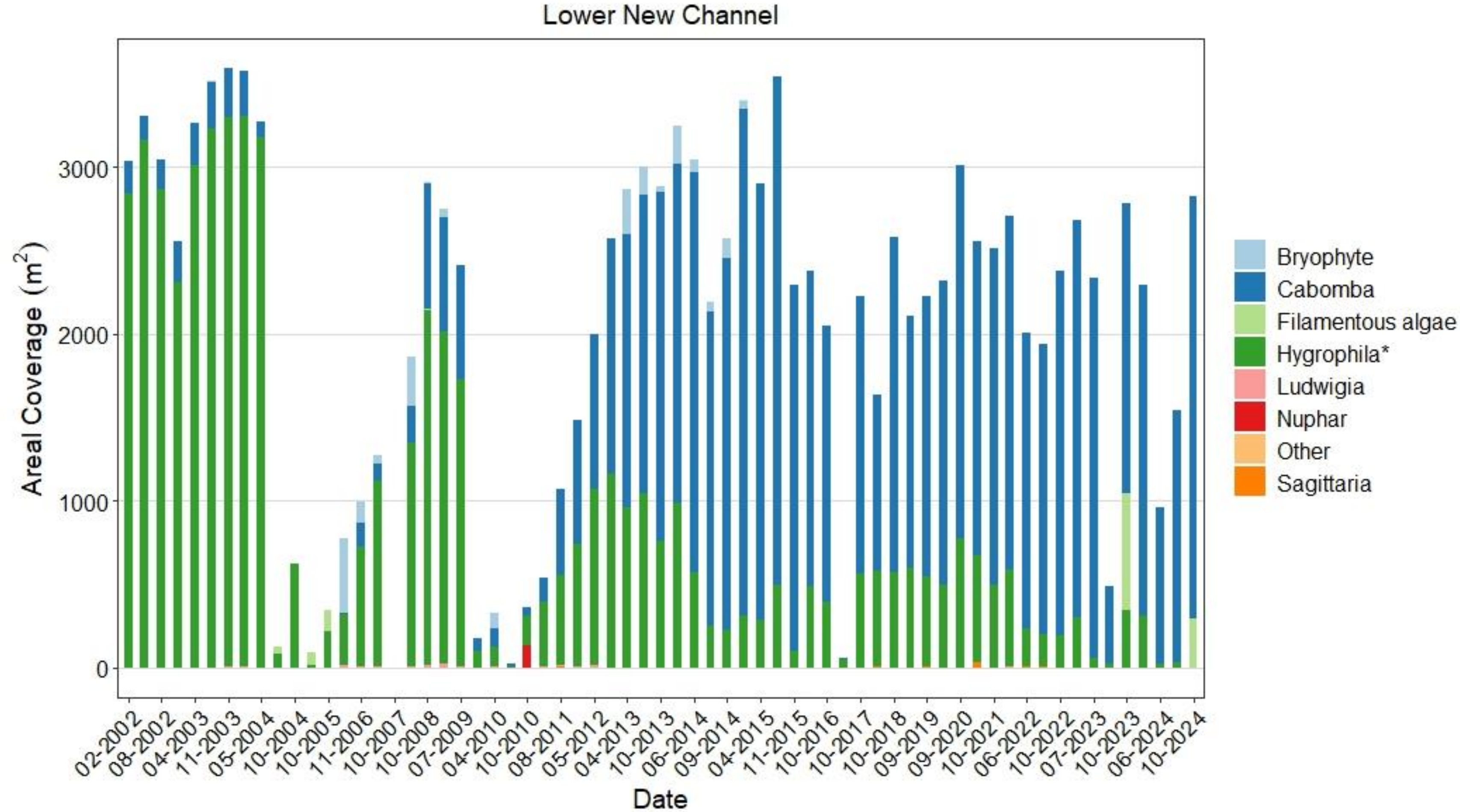

Figure E6. **Aquatic vegetation composition (m^2) among select taxa from 2002–2024 at the Lower New Channel. (*) in the legend denotes non-native taxa.**

Fountain Darter

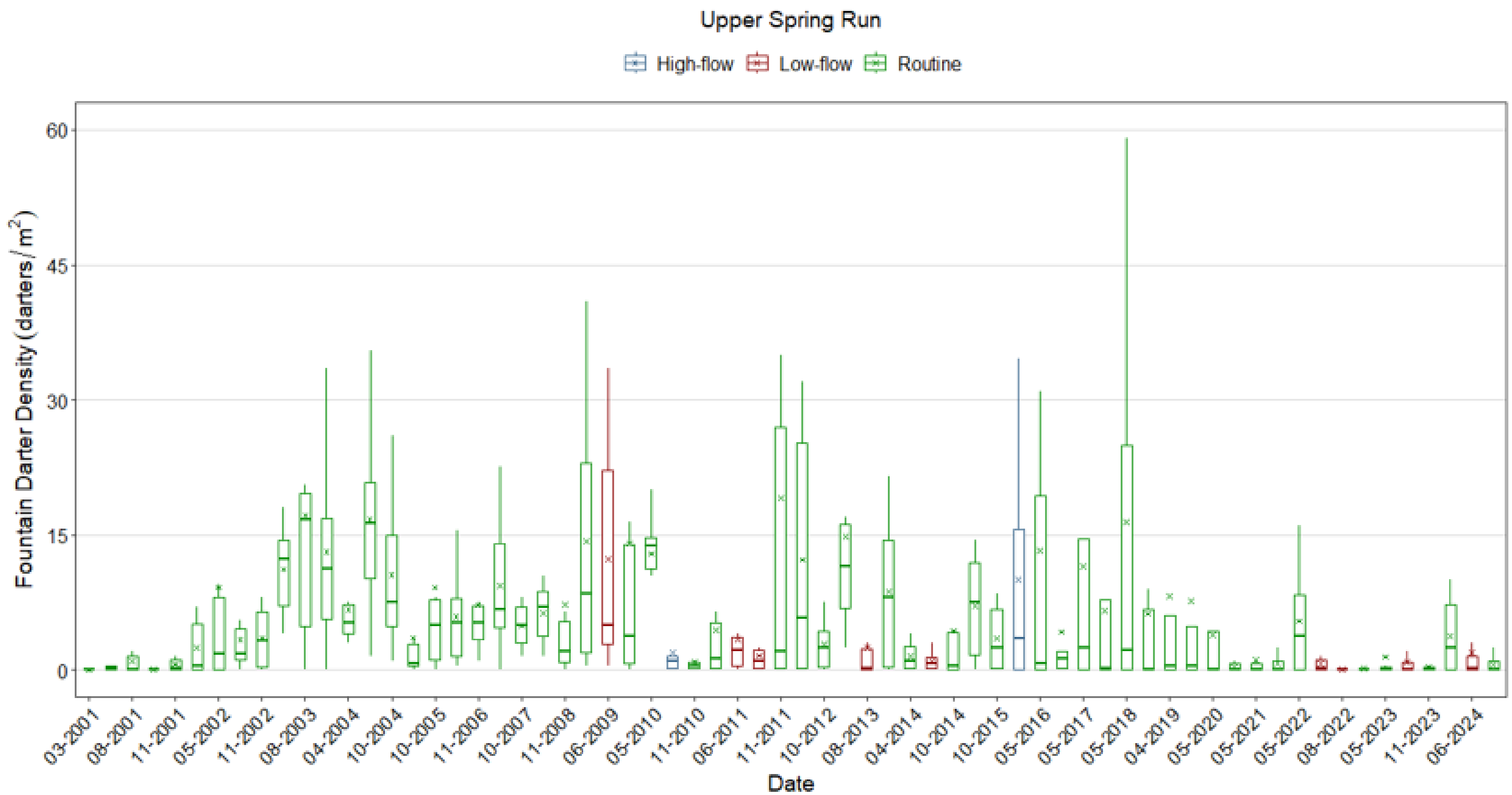

Figure E7. Boxplots displaying temporal trends in Fountain Darter density (darters/m^2) from 2001–2024 during drop-net sampling at Upper Spring Run. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range.

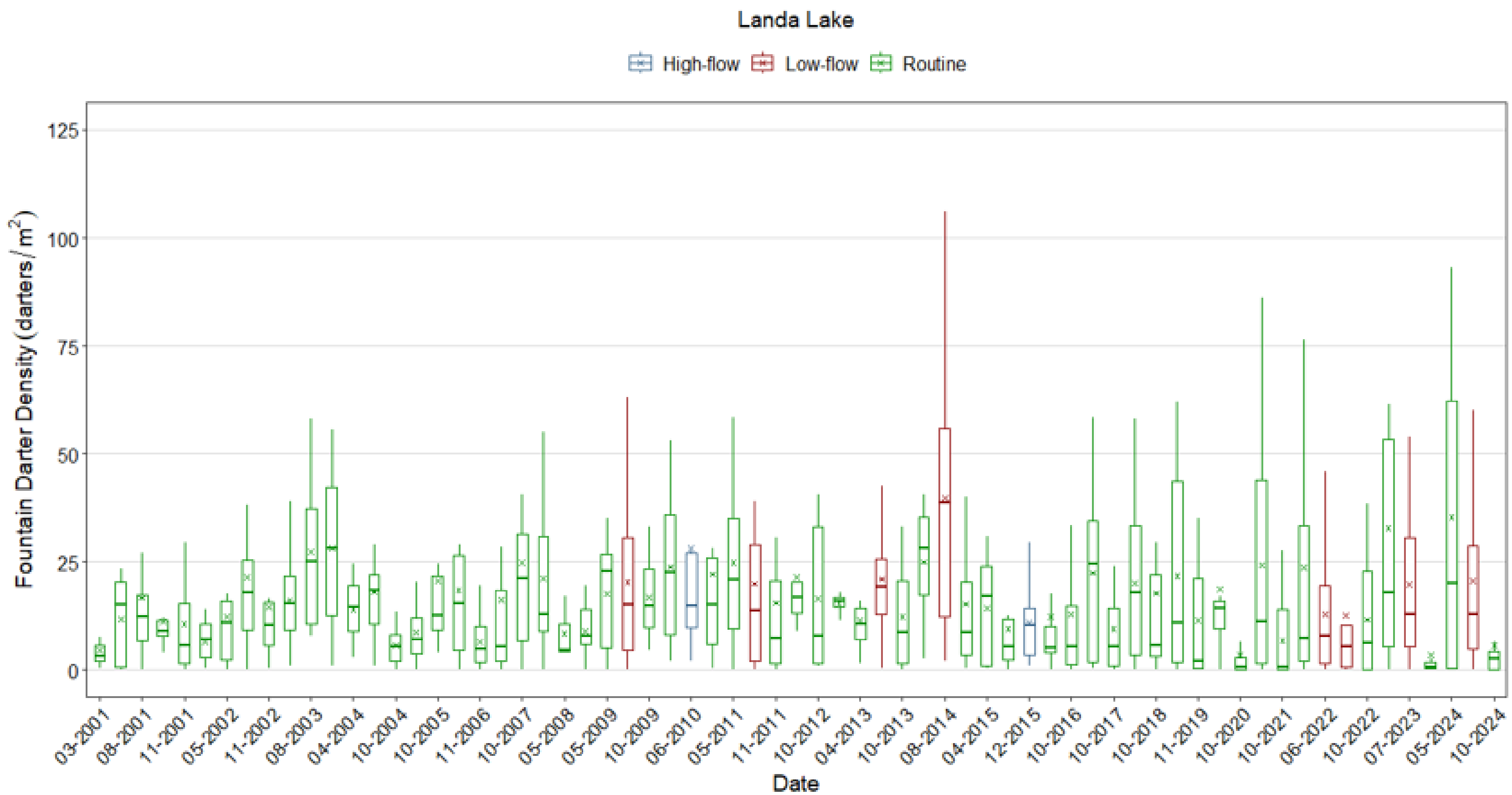

Figure E8. **Boxplots displaying temporal trends in Fountain Darter density (darters/m^2) from 2001–2024 during drop-net sampling at Landa Lake. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range.**

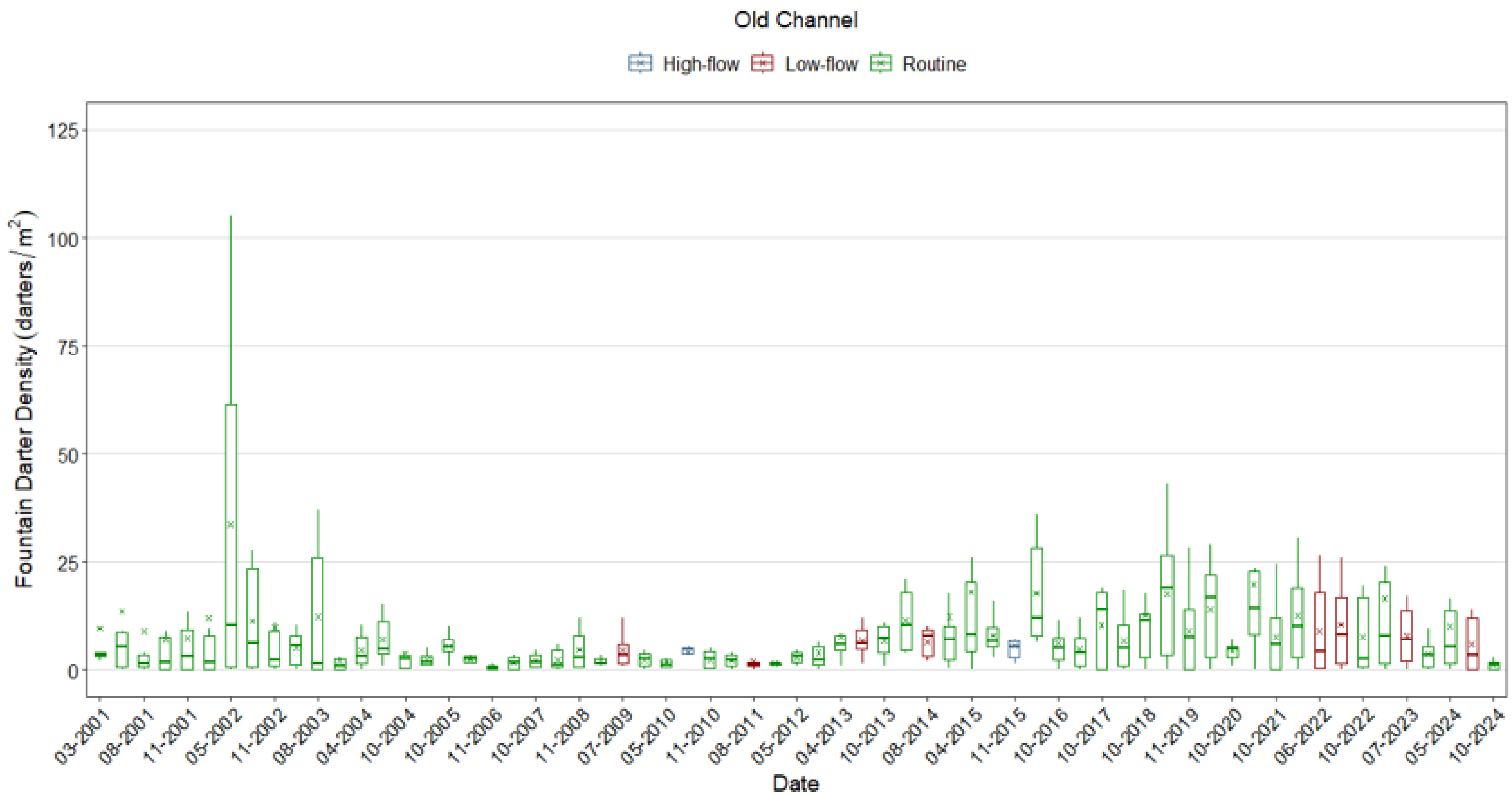

Figure E9. **Boxplots displaying temporal trends in Fountain Darter density (darters/m^2) from 2001–2024 during drop-net sampling at Old Channel. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range.**

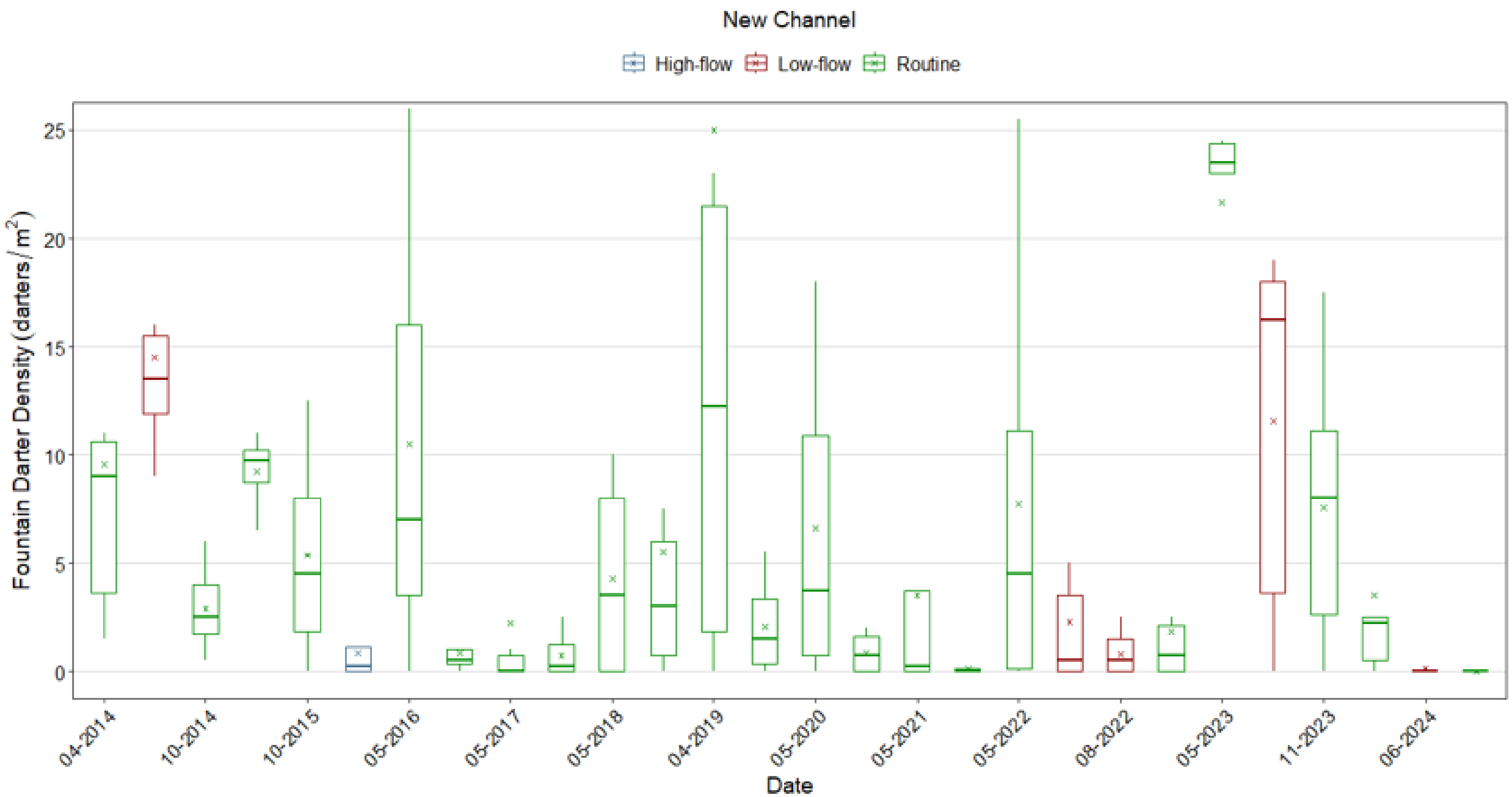

Figure E10. **Boxplots displaying temporal trends in Fountain Darter density (darters/m^2) from 2014–2024 during drop-net sampling at New Channel. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range.**

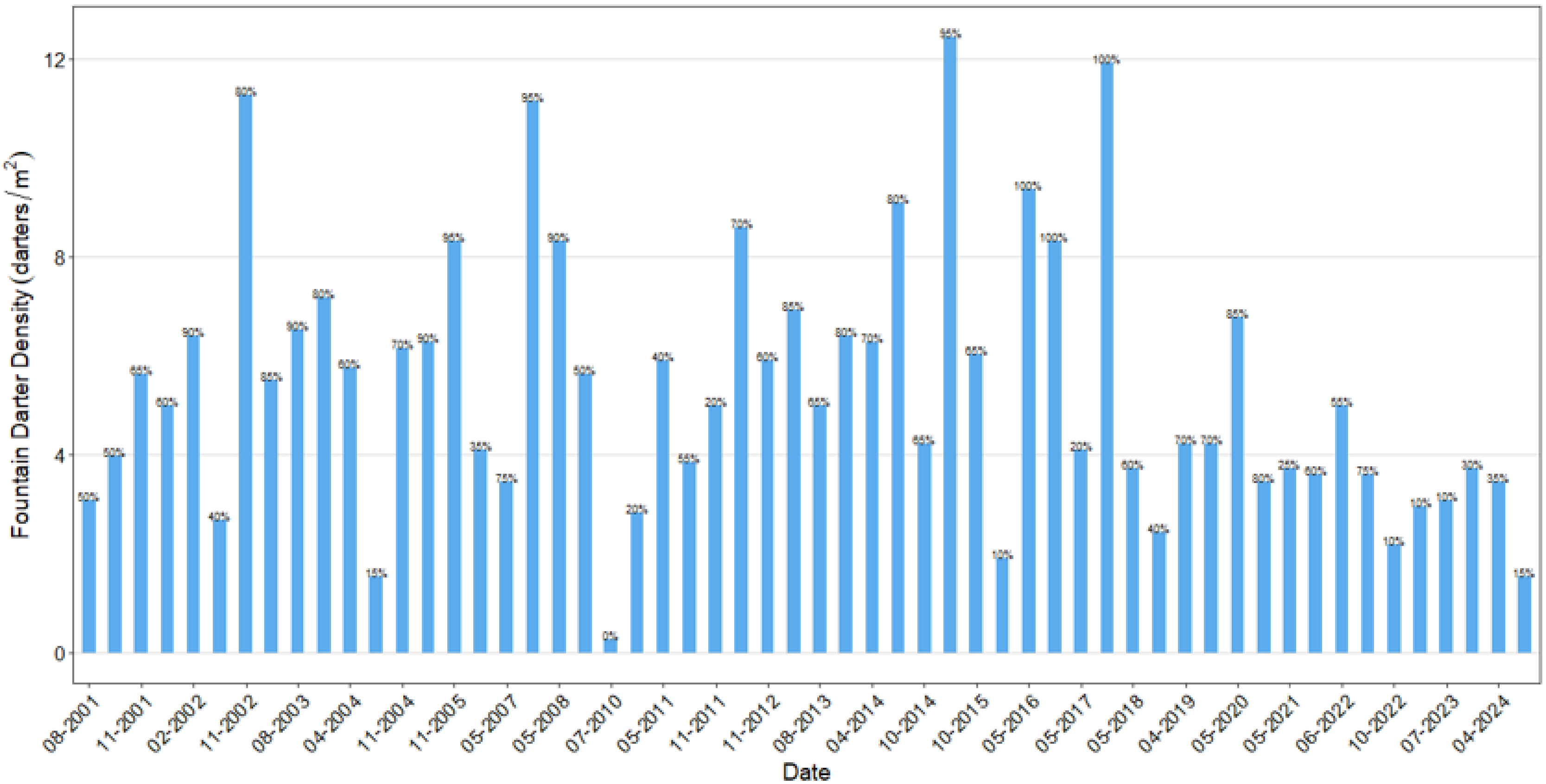

Figure E11. Boxplots displaying temporal trends in Fountain Darter density (darters/m^2) from 2001–2024 during visual surveys at Landa Lake. Percentages above the bars represent bryophyte coverage observed during each survey event.

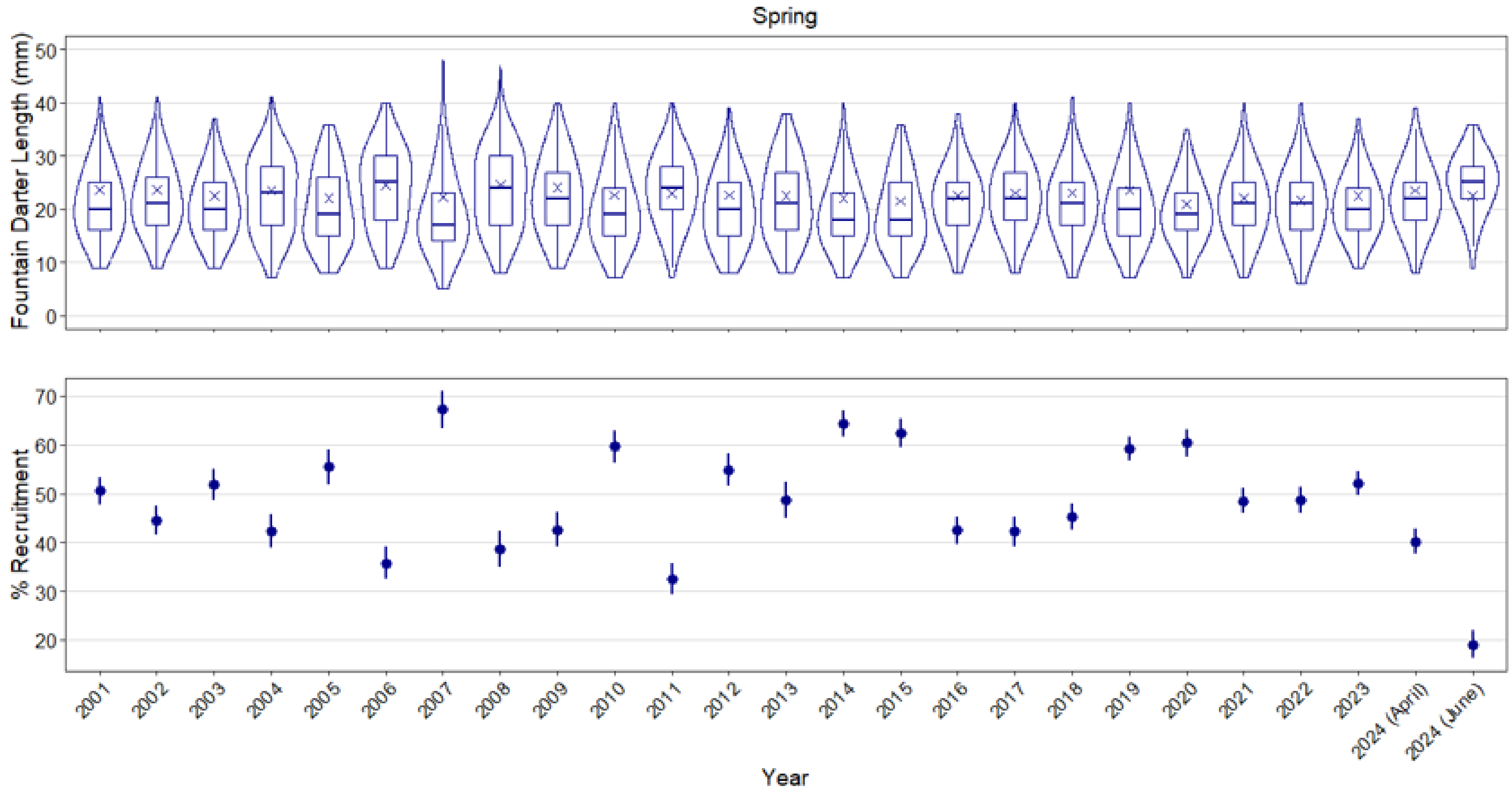

Figure E12. Fountain Darter size structure (mm; top row) and percent recruitment (bottom row) in the Comal Springs and River during spring sampling (i.e., drop-net and timed dip-net data) events from 2001–2024. Size structure is displayed with boxplots (median, quartiles, range) and violin plots (probability density; polygons outlining boxplots). The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range. Recruitment is the percent relative abundance (± 95% CI) of darters ≤20 mm.

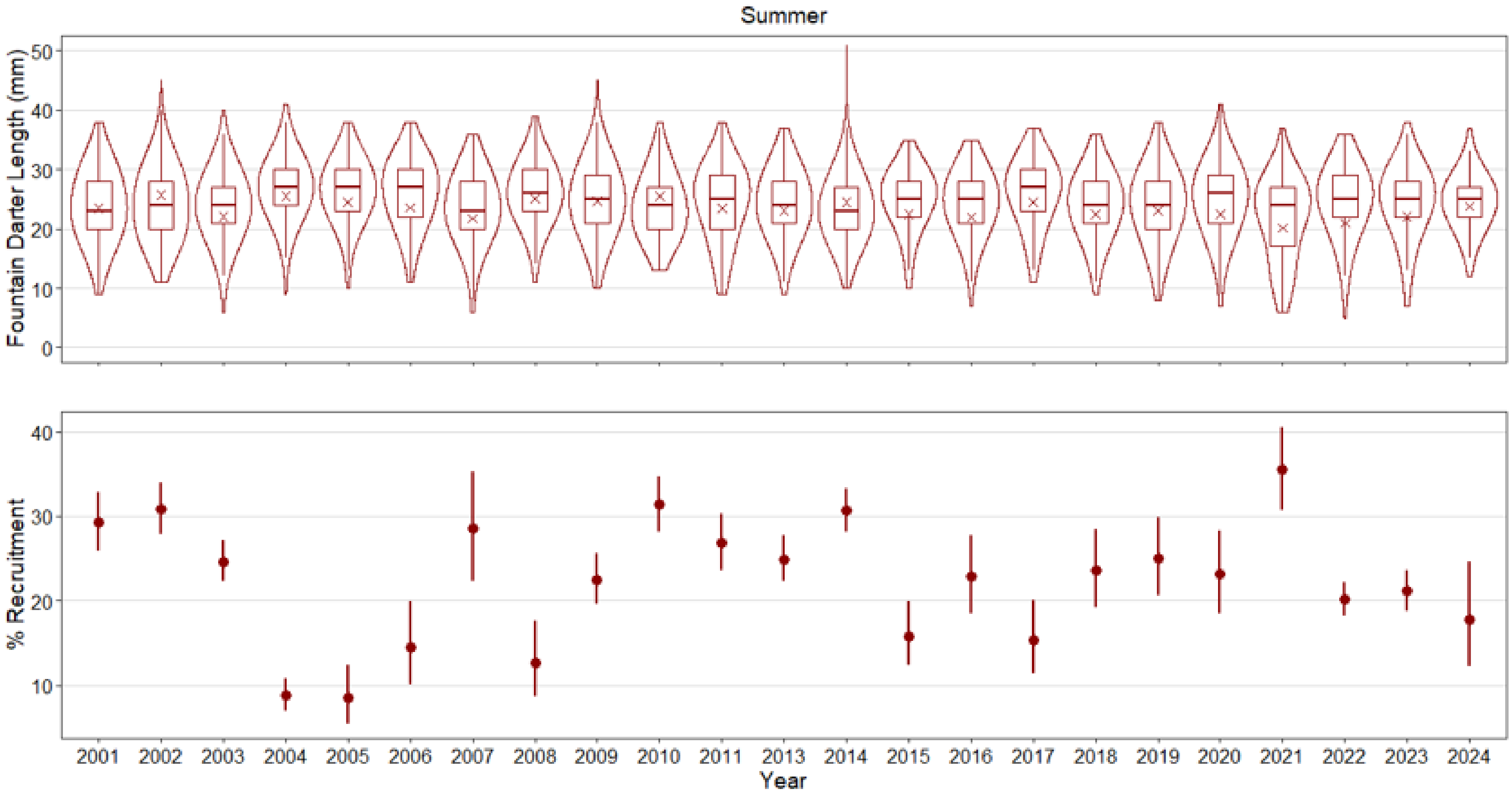

Figure E13. **Fountain Darter size structure (mm; top row) and percent recruitment (bottom row) in the Comal Springs and River during summer sampling (i.e., drop-net and timed dip-net data) events from 2001–2024. Size structure is displayed with boxplots (median, quartiles, range) and violin plots (probability density; polygons outlining boxplots). The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range. Recruitment is the percent relative abundance (± 95% CI) of darters ≤20 mm.**

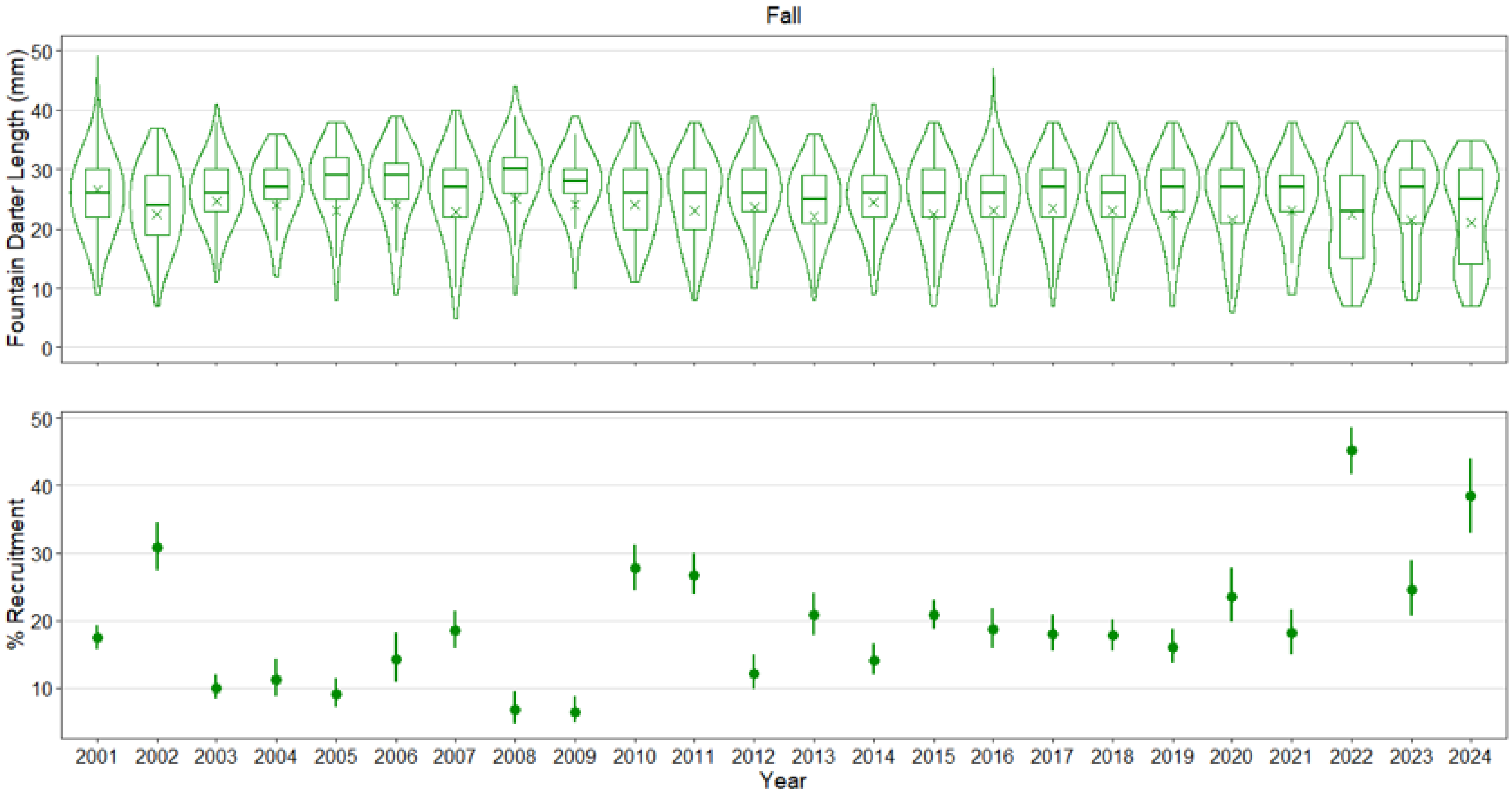

Figure E14. **Fountain Darter size structure (mm; top row) and percent recruitment (bottom row) in the Comal Springs and River during fall sampling (i.e., drop-net and timed dip-net data) events from 2001–2024. Size structure is displayed with boxplots (median, quartiles, range) and violin plots (probability density; polygons outlining boxplots). The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range. Recruitment is the percent relative abundance (± 95% CI) of darters ≤20 mm.**

Figure E15. **Overall Habitat Suitability Index (OHSI) (±95% CI) from 2003–2024 among study reaches in the Comal Springs/River.**

Fish Community

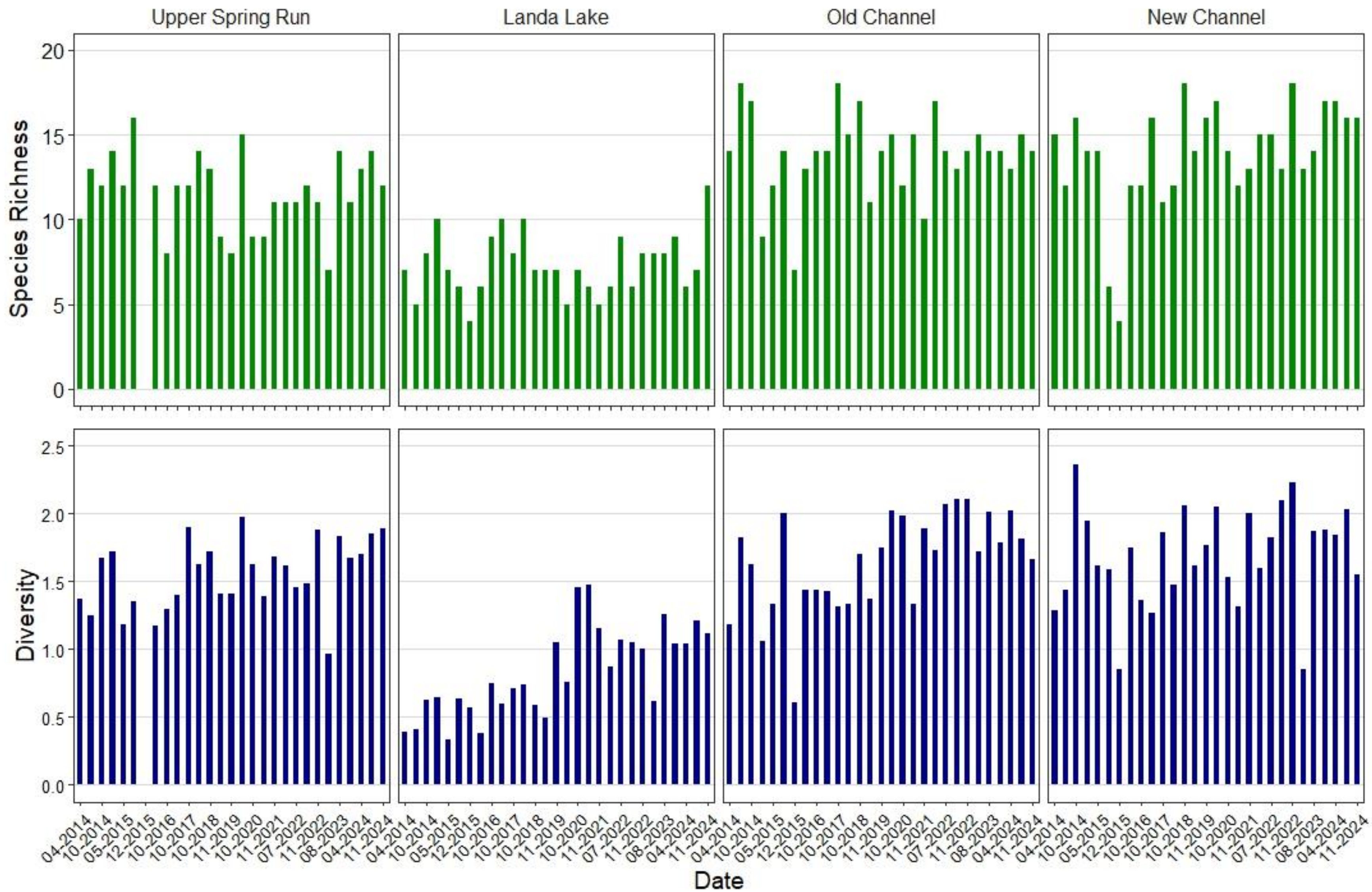

Figure E16. **Bar graphs displaying temporal trends in species richness and diversity among study reaches from 2014–2024 during fish community sampling in the Comal Springs/River.**

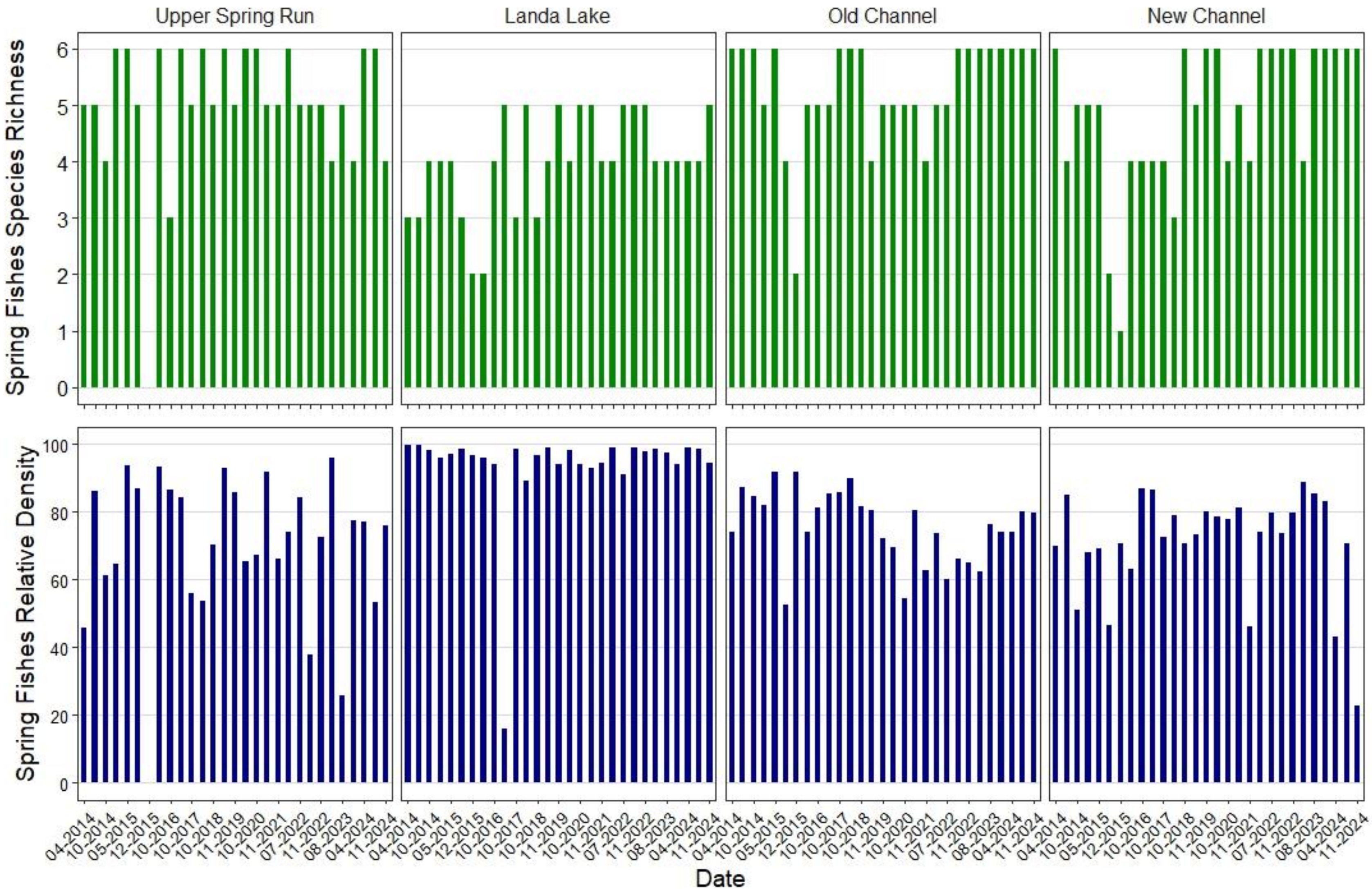

Figure E17. **Bar graphs displaying temporal trends in spring fishes species richness and percent relative density among study reaches from 2014–2024 during fish community sampling in the Comal Springs/River.**

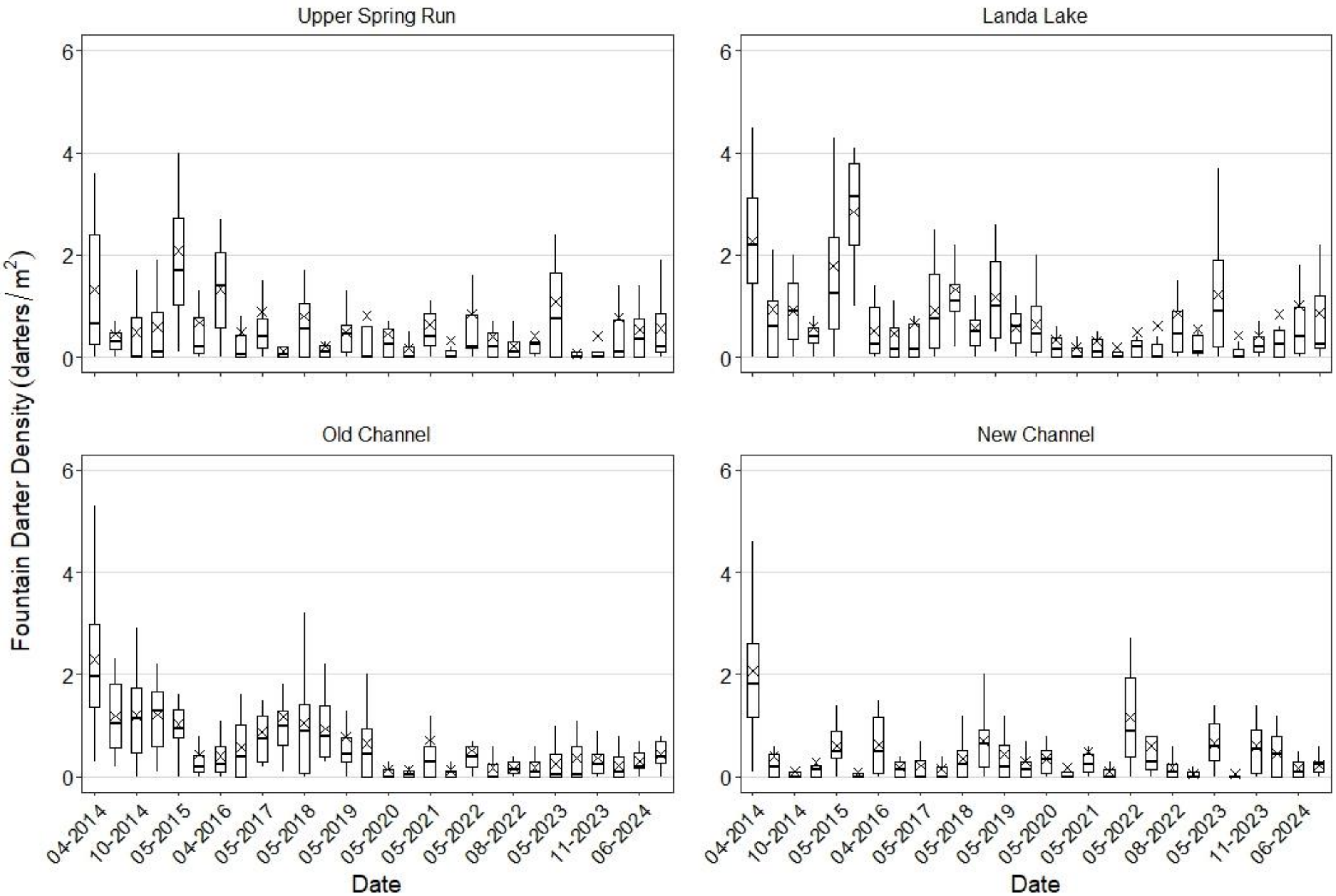

Figure E18. Boxplots displaying temporal trends in Fountain Darter density (darters/m^2) among study reaches from 2014–2024 during fish community microhabitat sampling in the Comal Springs/River. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range.

Comal Springs Salamander

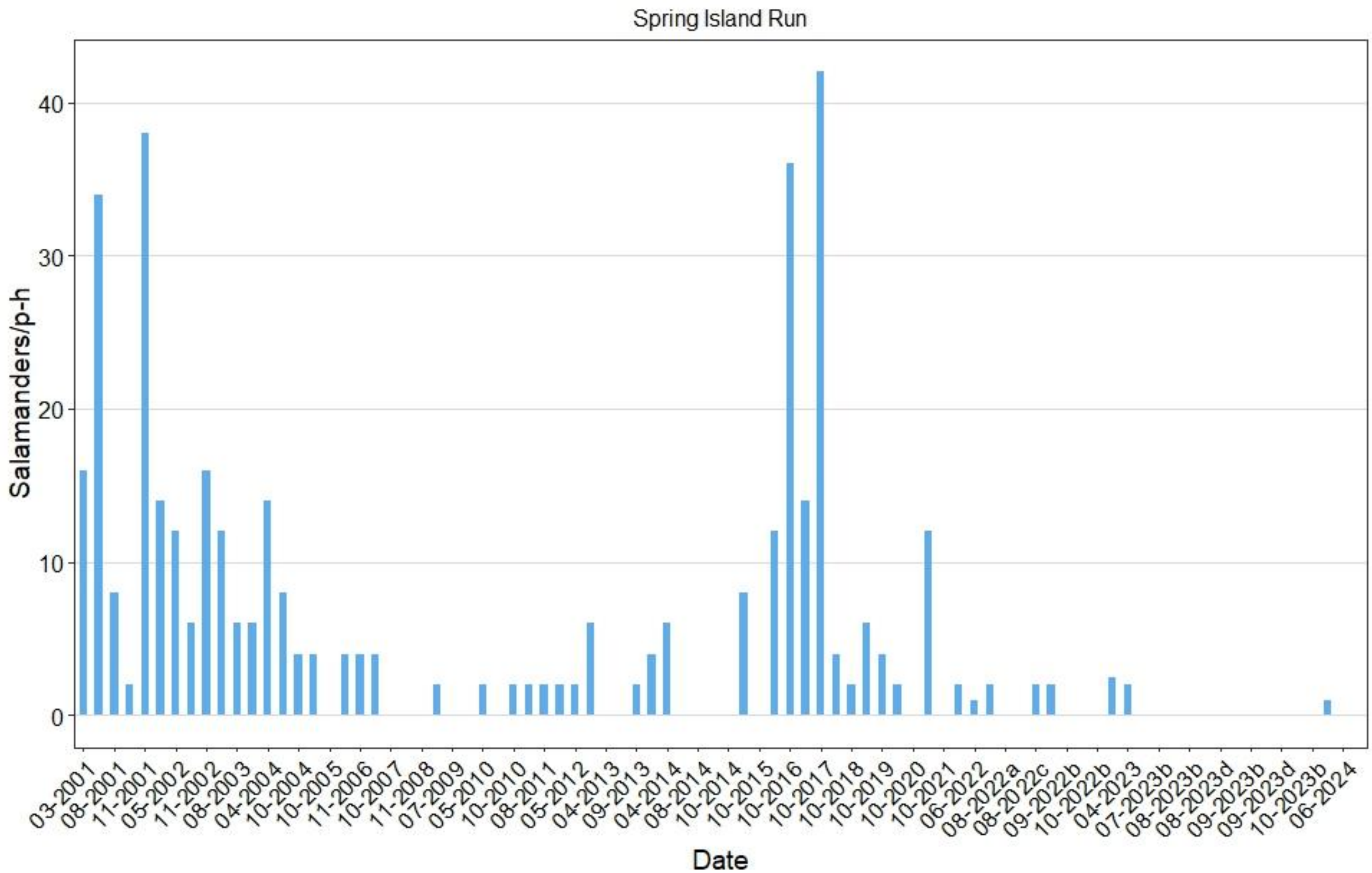

Figure E19. **Comal Springs Salamander catch-per-unit-effort (CPUE; salamanders/person-hr) from 2001–2024 at Spring Island Run.**

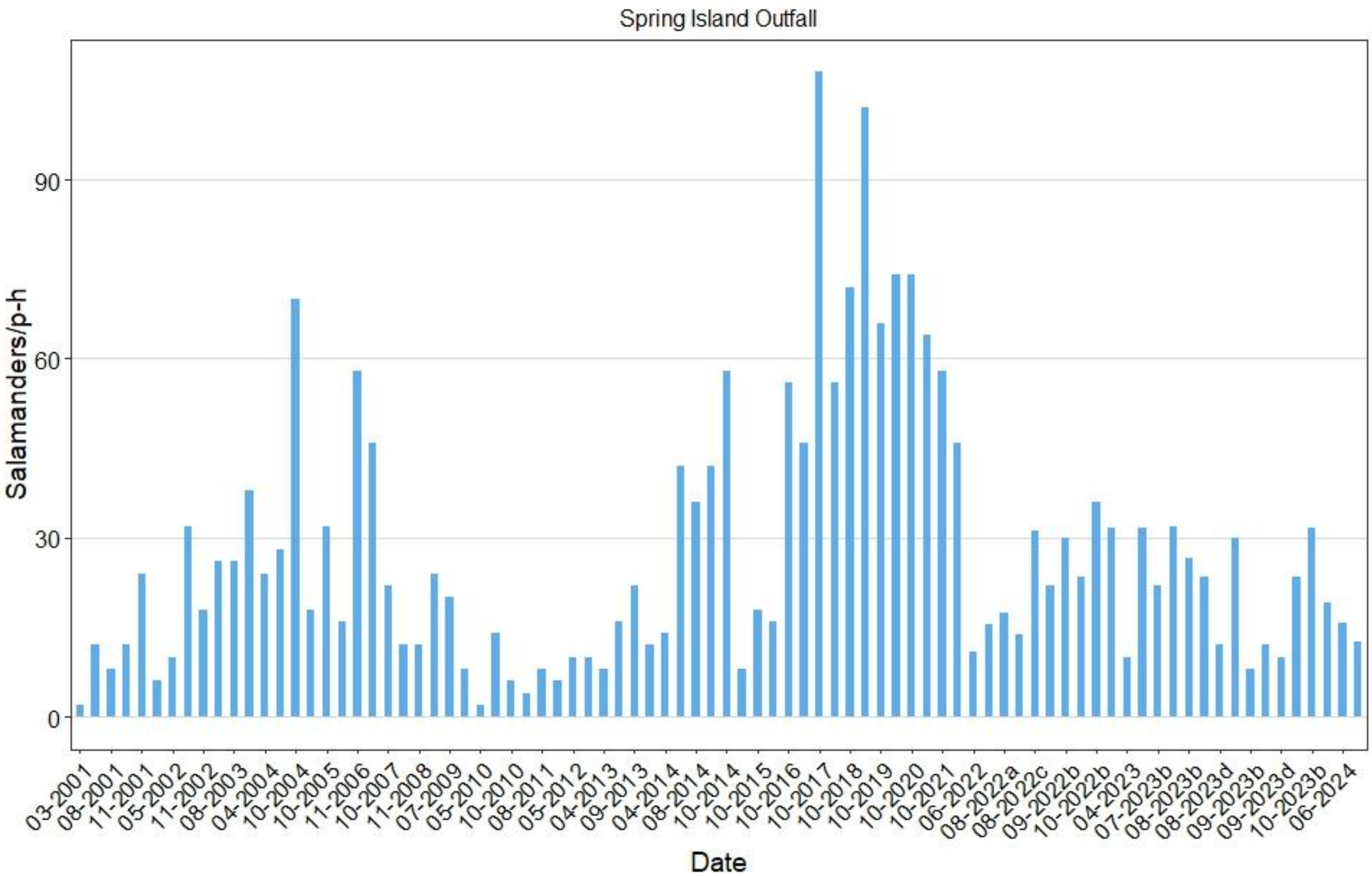

Figure E20. **Comal Springs Salamander catch-per-unit-effort (CPUE; salamanders/person-hr) from 2001–2024 at Spring Island Outfall.**

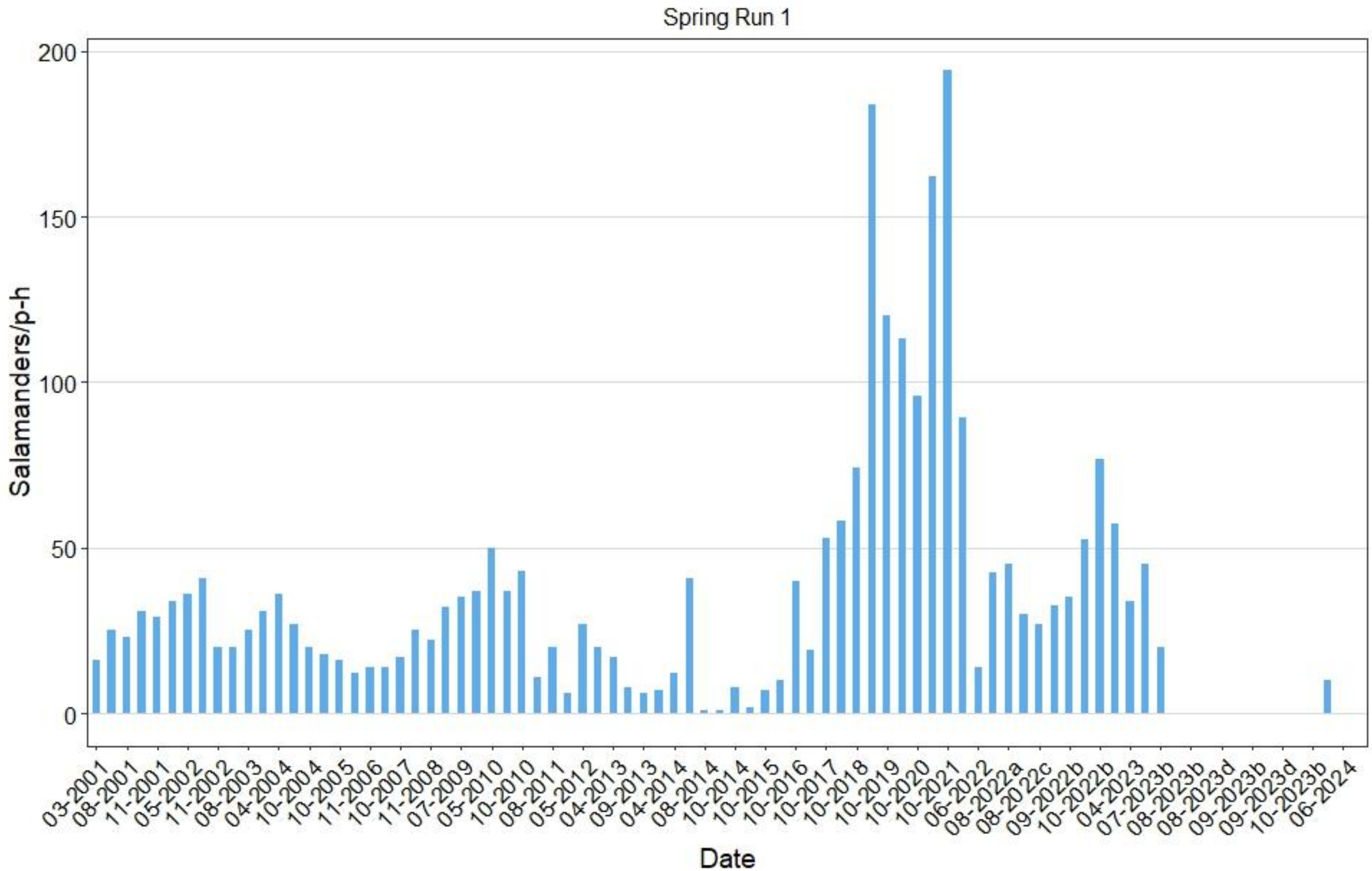

Figure E21. Comal Springs Salamander catch-per-unit-effort (CPUE; salamanders/person-hr) from 2001–2024 at Spring Run 1.

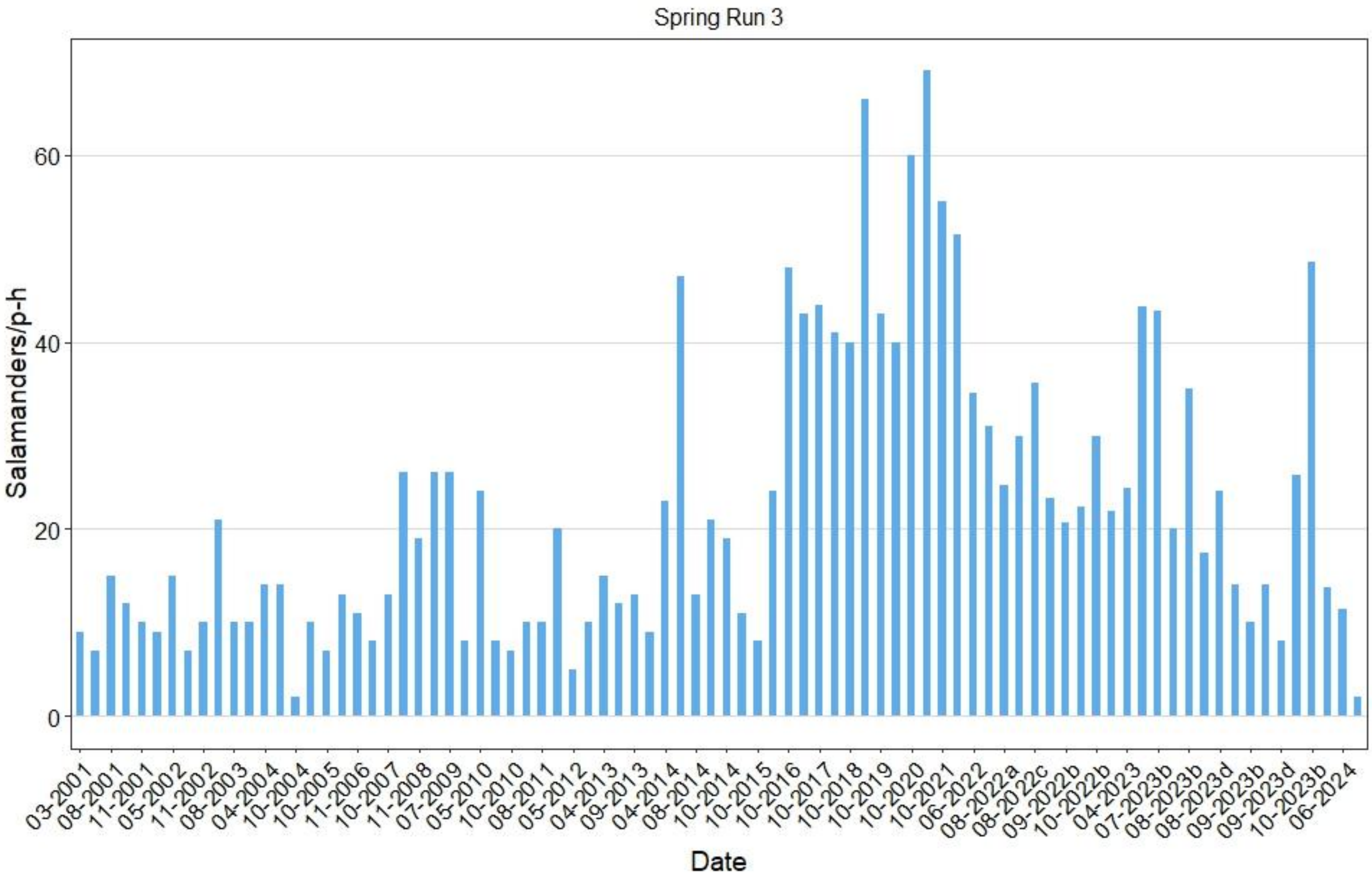

Figure E22. **Comal Springs Salamander catch-per-unit-effort (CPUE; salamanders/person-hr) from 2001–2024 at Spring Run 3.**

Macroinvertebrates

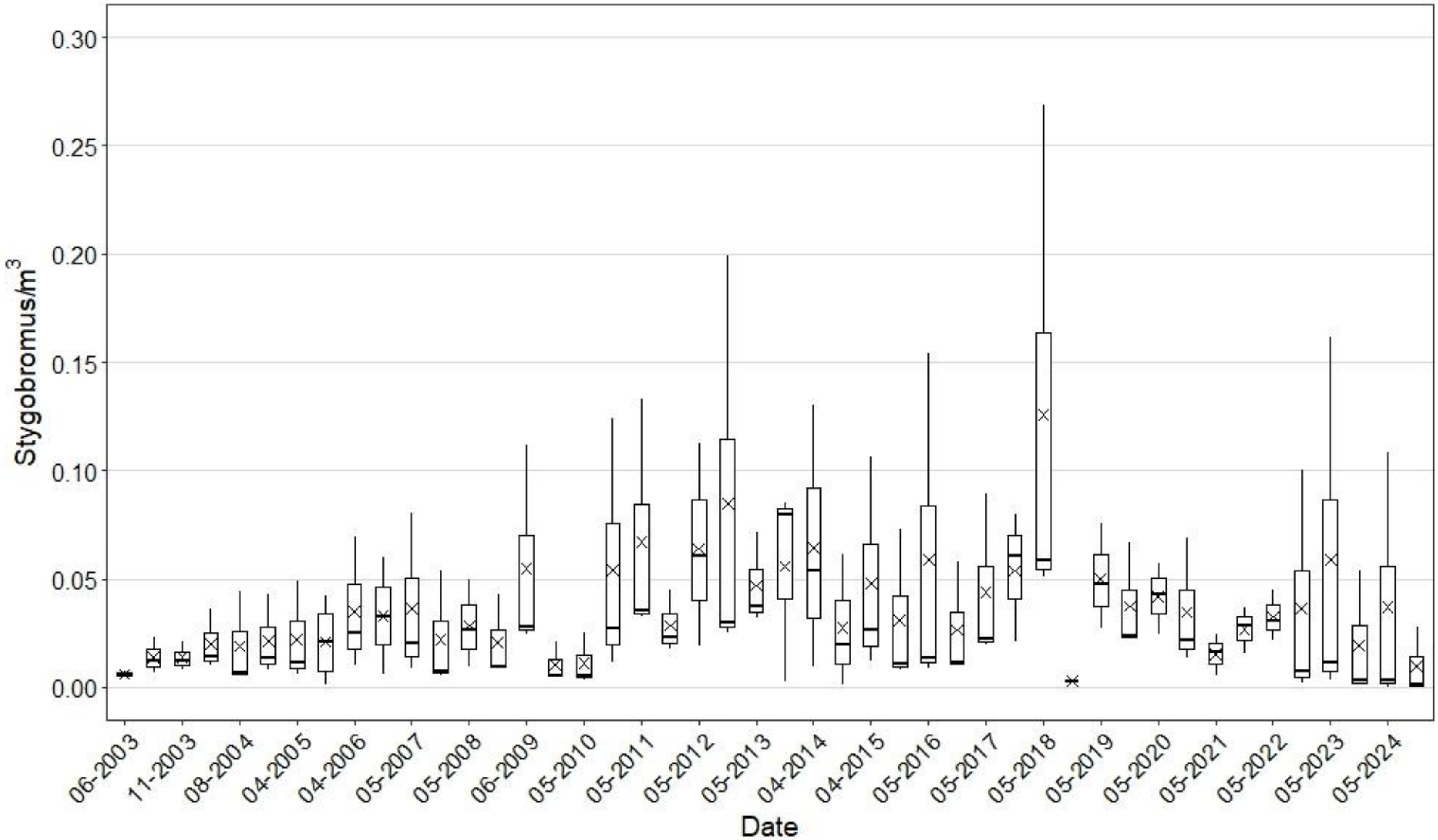

Figure E23. **Boxplots displaying *Stygobromus* sp. per cubic meters of water at Western Upwelling, Spring Run 1, and Spring Run 3 from 2003–2024. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range.**

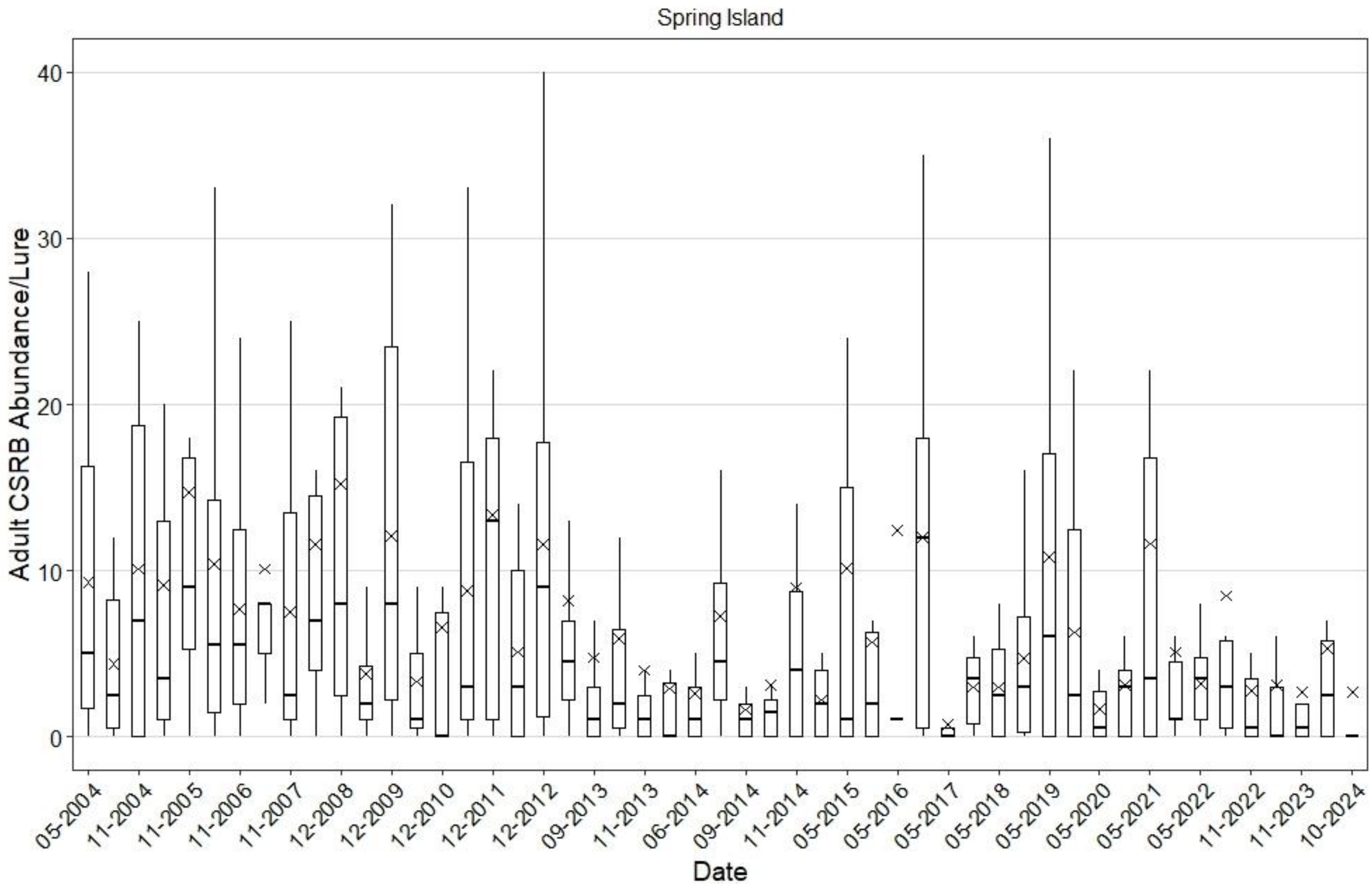

Figure E24. **Boxplots displaying temporal trends in adult CSRB abundance per retrieved at Spring Island from 2004–2024 during lure sampling in Comal Springs. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range.**

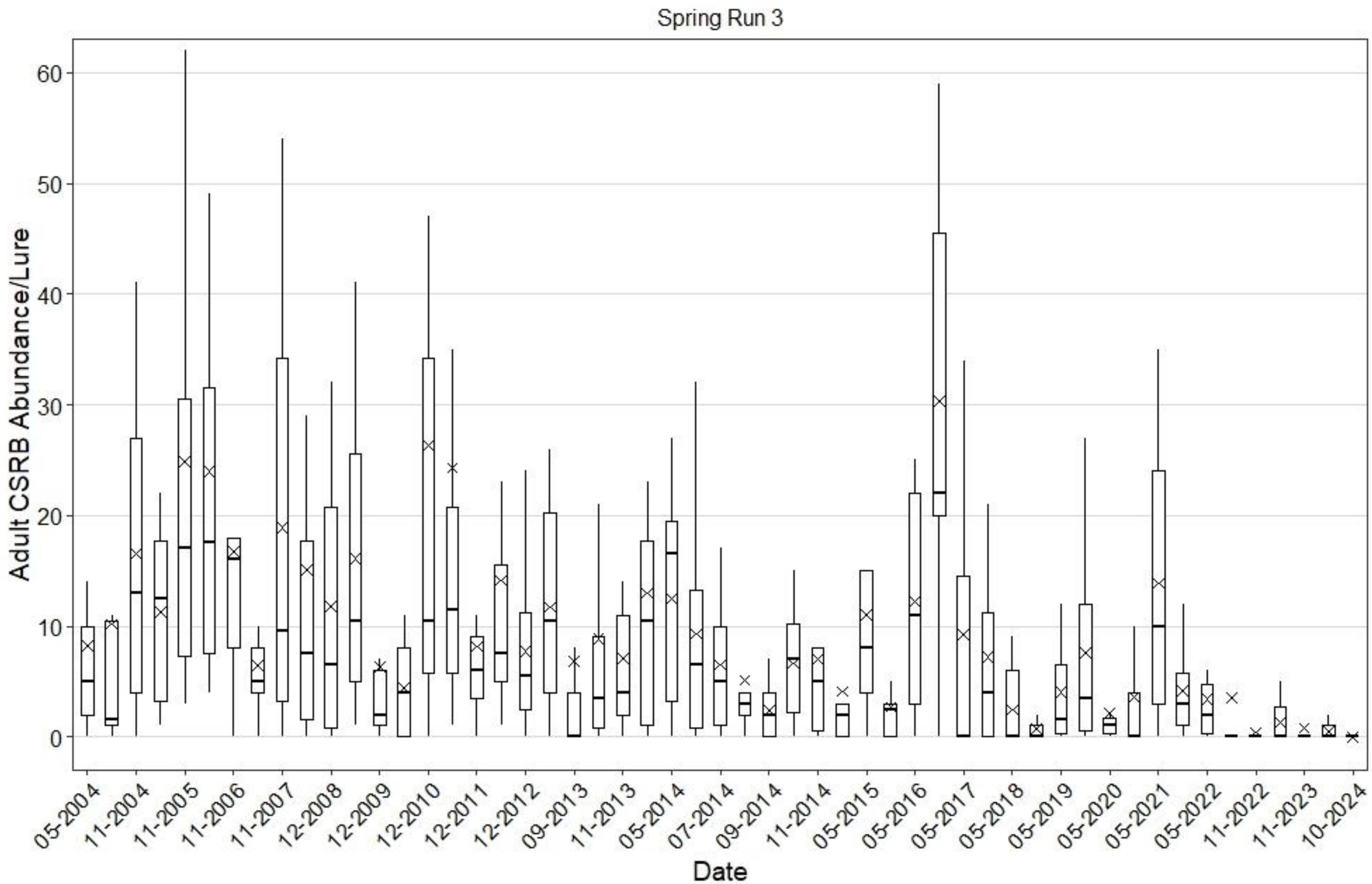

Figure E25. **Boxplots displaying temporal trends in adult CSRB abundance per retrieved at Spring Run 3 from 2004–2024 during lure sampling in Comal Springs. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range.**

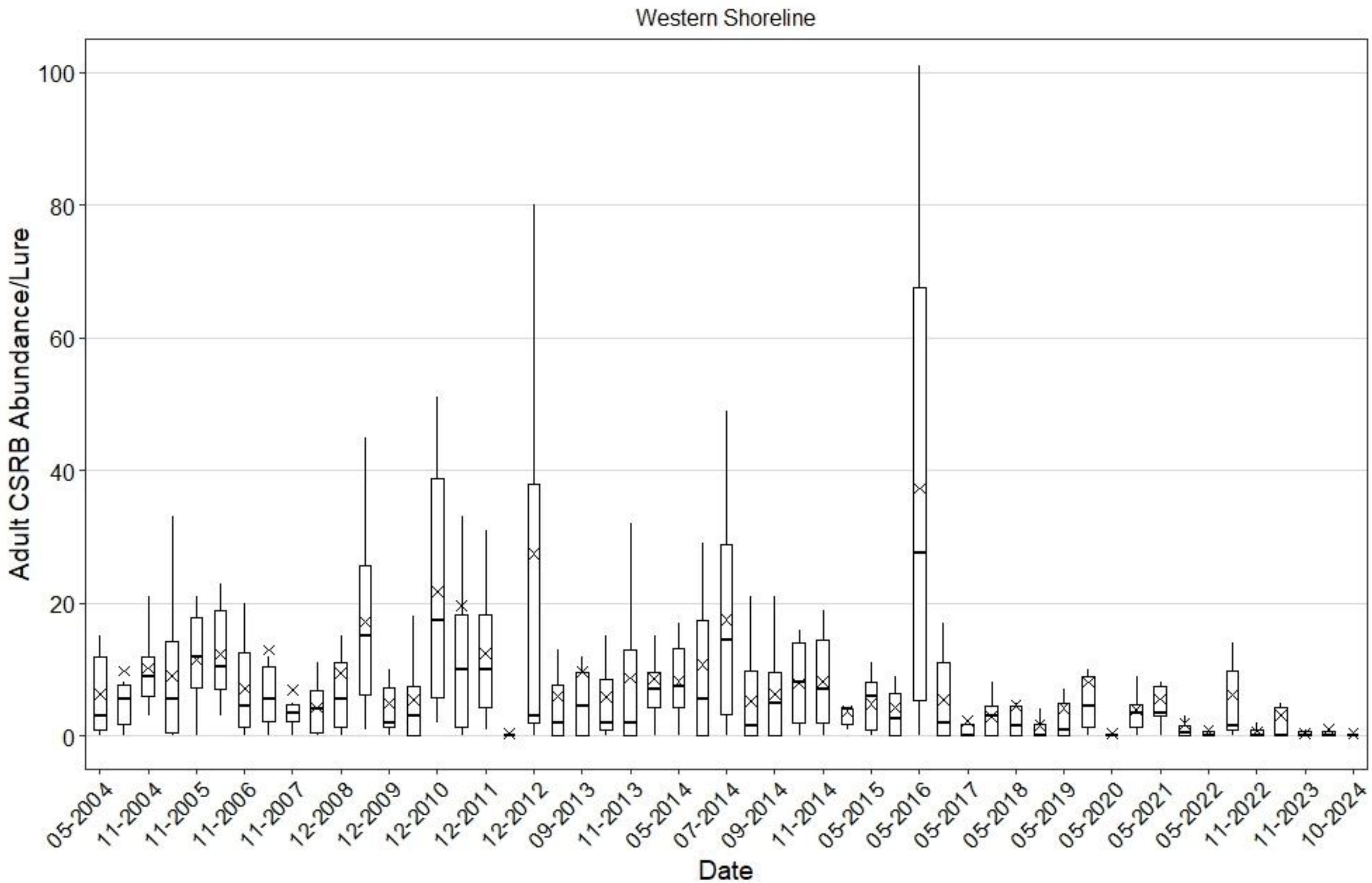

Figure E26. **Boxplots displaying temporal trends in adult CSRB abundance per retrieved at the Western Shoreline from 2004–2024 during lure sampling in Comal Springs. The thick horizontal line in each box is the median, x represents the mean, and the upper/lower bounds of each box represents the interquartile range. Whiskers represent minimum/maximum values up to 1.5 times the interquartile range.**

APPENDIX F: MACROINVERTEBRATE RAW DATA

Site	Date	Season	Class	Order	Family	FinalID	Counts
Upper Spring Run	5/1/2024	Spring	Malacostraca	Amphipoda	Hyalellidae	Hyalella	76
Upper Spring Run	5/1/2024	Spring	Insecta	Coleoptera	Dytiscidae	Neoclypeodytes discretus	2
Upper Spring Run	5/1/2024	Spring	Insecta	Coleoptera	Elmidae	Stenelmis	1
Upper Spring Run	5/1/2024	Spring	Insecta	Coleoptera	Psephenidae	Psephenus texanus	16
Upper Spring Run	5/1/2024	Spring	Malacostraca	Decapoda	Cambaridae	Cambaridae	3
Upper Spring Run	5/1/2024	Spring	Insecta	Diptera	Chironomidae	Chironomidae	4
Upper Spring Run	5/1/2024	Spring	Insecta	Ephemeroptera	Baetidae	Callibaetis	39
Upper Spring Run	5/1/2024	Spring	Insecta	Ephemeroptera	Caenidae	Caenis	2
Upper Spring Run	5/1/2024	Spring	Insecta	Ephemeroptera	Heptageniidae	Stenonema	5
Upper Spring Run	5/1/2024	Spring	Insecta	Ephemeroptera	Leptohyphidae	Tricorythodes	32
Upper Spring Run	5/1/2024	Spring	Gastropoda	Littorinimorpha	Hydrobiidae	Hydrobiidae	4
Upper Spring Run	5/1/2024	Spring	Insecta	Odonata	Coenagrionidae	Enallagma	5
Upper Spring Run	5/1/2024	Spring	Gastropoda		Physidae	Physella	1
Upper Spring Run	5/1/2024	Spring	Gastropoda		Planorbidae	Planorbella	3
Upper Spring Run	5/1/2024	Spring	Gastropoda		Pleuroceridae	Elimia	1
Upper Spring Run	5/1/2024	Spring	Gastropoda		Thiaridae	Melanoides tuberculata	10
Upper Spring Run	5/1/2024	Spring	Clitellata			Hirudinea	1
Upper Spring Run	5/1/2024	Spring	Clitellata			Oligochaeta	2
Upper Spring Run	10/23/2024	Fall	Malacostraca	Amphipoda	Hyalellidae	Hyalella	117
Upper Spring Run	10/23/2024	Fall	Insecta	Coleoptera	Dytiscidae	Neoclypeodytes discretus	1
Upper Spring Run	10/23/2024	Fall	Insecta	Coleoptera	Helophoridae	Helophorus	1
Upper Spring Run	10/23/2024	Fall	Insecta	Coleoptera	Hydrophilidae	Helochares	1
Upper Spring Run	10/23/2024	Fall	Insecta	Coleoptera	Psephenidae	Psephenus texanus	4
Upper Spring Run	10/23/2024	Fall	Malacostraca	Decapoda	Cambaridae	Cambaridae	2
Upper Spring Run	10/23/2024	Fall	Insecta	Diptera	Ceratopogonidae	Bezzia complex	3
Upper Spring Run	10/23/2024	Fall	Insecta	Diptera	Chironomidae	Chironomidae	14
Upper Spring Run	10/23/2024	Fall	Insecta	Diptera	Culicidae	Culicidae	1
Upper Spring Run	10/23/2024	Fall	Insecta	Ephemeroptera	Baetidae	Callibaetis	7
Upper Spring Run	10/23/2024	Fall	Insecta	Ephemeroptera	Caenidae	Caenis	1

Upper Spring Run	10/23/2024	Fall	Gastropoda		Thiaridae	Melanoides tuberculata	1
Upper Spring Run	10/23/2024	Fall	Clitellata			Oligochaeta	2
Landa Lake	5/1/2024	Spring	Malacostraca	Amphipoda	Hyalellidae	Hyalella	93
Landa Lake	5/1/2024	Spring	Insecta	Coleoptera	Scirtidae	Scirtidae	1
Landa Lake	5/1/2024	Spring	Malacostraca	Decapoda	Cambaridae	Cambaridae	3
Landa Lake	5/1/2024	Spring	Malacostraca	Decapoda	Palaemonidae	Palaemon	5
Landa Lake	5/1/2024	Spring	Insecta	Diptera	Ceratopogonidae	Bezzia complex	1
Landa Lake	5/1/2024	Spring	Insecta	Diptera	Chironomidae	Chironomidae	2
Landa Lake	5/1/2024	Spring	Insecta	Ephemeroptera	Baetidae	Callibaetis	8
Landa Lake	5/1/2024	Spring	Insecta	Ephemeroptera	Caenidae	Caenis	3
Landa Lake	5/1/2024	Spring	Insecta	Ephemeroptera	Heptageniidae	Stenonema	1
Landa Lake	5/1/2024	Spring	Insecta	Ephemeroptera	Leptohyphidae	Tricorythodes	5
Landa Lake	5/1/2024	Spring	Insecta	Hemiptera	Corixidae	Trichocorixa	5
Landa Lake	5/1/2024	Spring	Insecta	Odonata	Coenagrionidae	Enallagma	1
Landa Lake	5/1/2024	Spring	Gastropoda		Physidae	Physella	3
Landa Lake	5/1/2024	Spring	Gastropoda		Planorbidae	Planorbella	1
Landa Lake	5/1/2024	Spring	Gastropoda		Pleuroceridae	Elimia	2
Landa Lake	5/1/2024	Spring	Gastropoda		Thiaridae	Melanoides tuberculata	21
Landa Lake	5/1/2024	Spring	Clitellata			Hirudinea	3
Landa Lake	5/1/2024	Spring	Clitellata			Oligochaeta	3
Landa Lake	10/23/2024	Fall	Malacostraca	Amphipoda	Hyalellidae	Hyalella	111
Landa Lake	10/23/2024	Fall	Insecta	Coleoptera	Haliplidae	Peltodytes sexmaculatus	1
Landa Lake	10/23/2024	Fall	Insecta	Coleoptera	Hydrophilidae	Helochares	3
Landa Lake	10/23/2024	Fall	Malacostraca	Decapoda	Cambaridae	Cambaridae	2
Landa Lake	10/23/2024	Fall	Insecta	Ephemeroptera	Baetidae	Callibaetis	3
Landa Lake	10/23/2024	Fall	Insecta	Ephemeroptera	Caenidae	Caenis	1
Landa Lake	10/23/2024	Fall	Insecta	Ephemeroptera	Leptohyphidae	Tricorythodes	2
Landa Lake	10/23/2024	Fall	Insecta	Odonata	Aeshnidae	Aeshnidae	1
Landa Lake	10/23/2024	Fall	Insecta	Odonata	Libellulidae	Libellulidae	1
Landa Lake	10/23/2024	Fall	Gastropoda		Thiaridae	Melanoides tuberculata	18

Landa Lake	10/23/2024	Fall	Clitellata			Oligochaeta	1
Old Channel	5/1/2024	Spring	Malacostraca	Amphipoda	Hyalellidae	Hyalella	56
Old Channel	5/1/2024	Spring	Insecta	Coleoptera	Psephenidae	Psephenus texanus	2
Old Channel	5/1/2024	Spring	Malacostraca	Decapoda	Cambaridae	Cambaridae	3
Old Channel	5/1/2024	Spring	Insecta	Diptera	Chironomidae	Chironomidae	2
Old Channel	5/1/2024	Spring	Insecta	Ephemeroptera	Caenidae	Caenis	3
Old Channel	5/1/2024	Spring	Insecta	Ephemeroptera	Ephemeridae	Hexagenia	2
Old Channel	5/1/2024	Spring	Insecta	Ephemeroptera	Heptageniidae	Stenonema	8
Old Channel	5/1/2024	Spring	Insecta	Ephemeroptera	Leptohyphidae	Tricorythodes	24
Old Channel	5/1/2024	Spring	Insecta	Hemiptera	Naucoridae	Limnocoris lutzi	3
Old Channel	5/1/2024	Spring	Insecta	Odonata	Calopterygidae	Hetaerina	1
Old Channel	5/1/2024	Spring	Insecta	Odonata	Coenagrionidae	Argia	2
Old Channel	5/1/2024	Spring	Insecta	Trichoptera	Helicopsychidae	Helicopsyche	2
Old Channel	5/1/2024	Spring	Insecta	Trichoptera	Leptoceridae	Nectopsyche	3
Old Channel	5/1/2024	Spring	Gastropoda		Pleuroceridae	Elimia	1
Old Channel	5/1/2024	Spring	Gastropoda		Thiaridae	Melanoides tuberculata	8
Old Channel	5/1/2024	Spring	Clitellata			Hirudinea	3
Old Channel	5/1/2024	Spring	Clitellata			Oligochaeta	11
Old Channel	10/23/2024	Fall	Malacostraca	Amphipoda	Hyalellidae	Hyalella	50
Old Channel	10/23/2024	Fall	Insecta	Coleoptera	Elmidae	Microcylloepus	1
Old Channel	10/23/2024	Fall	Malacostraca	Decapoda	Cambaridae	Cambaridae	2
Old Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Baetidae	Baetis	18
Old Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Caenidae	Caenis	1
Old Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Ephemeridae	Hexagenia	1
Old Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Heptageniidae	Stenonema	2
Old Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Leptohyphidae	Tricorythodes	22
Old Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Leptophlebiidae	Thraulodes	1
Old Channel	10/23/2024	Fall	Insecta	Hemiptera	Naucoridae	Limnocoris lutzi	1
Old Channel	10/23/2024	Fall	Annelida	Hirudinea	Erpobdellidae	Erpobdella	1
Old Channel	10/23/2024	Fall	Annelida	Hirudinea	Glossosiphonidae	Glossosiphonidae	1

Old Channel	10/23/2024	Fall	Insecta	Odonata	Calopterygidae	Hetaerina	1
Old Channel	10/23/2024	Fall	Insecta	Odonata	Coenagrionidae	Argia	14
Old Channel	10/23/2024	Fall	Insecta	Odonata	Gomphidae	Phyllogomphoides	3
Old Channel	10/23/2024	Fall	Insecta	Odonata	Macromiidae	Didymops	1
Old Channel	10/23/2024	Fall	Insecta	Trichoptera	Helicopsychidae	Helicopsyche	4
Old Channel	10/23/2024	Fall		Tricladida	Dugesiidae	Dugesia	2
Old Channel	10/23/2024	Fall	Gastropoda		Pleuroceridae	Elimia	2
Old Channel	10/23/2024	Fall	Gastropoda		Thiaridae	Melanoides tuberculata	5
Old Channel	10/23/2024	Fall	Clitellata			Oligochaeta	9
Upper New Channel	5/1/2024	Spring	Malacostraca	Amphipoda	Hyalellidae	Hyalella	52
Upper New Channel	5/1/2024	Spring	Insecta	Coleoptera	Dytiscidae	Neoclypeodytes discretus	1
Upper New Channel	5/1/2024	Spring	Insecta	Coleoptera	Elmidae	Macrelmis	23
Upper New Channel	5/1/2024	Spring	Insecta	Coleoptera	Psephenidae	Psephenus texanus	10
Upper New Channel	5/1/2024	Spring	Malacostraca	Decapoda	Cambaridae	Cambaridae	1
Upper New Channel	5/1/2024	Spring	Malacostraca	Decapoda	Palaemonidae	Palaemon	2
Upper New Channel	5/1/2024	Spring	Insecta	Diptera	Chironomidae	Chironomidae	2
Upper New Channel	5/1/2024	Spring	Insecta	Ephemeroptera	Baetidae	Callibaetis	4
Upper New Channel	5/1/2024	Spring	Insecta	Ephemeroptera	Heptageniidae	Stenonema	2
Upper New Channel	5/1/2024	Spring	Insecta	Ephemeroptera	Leptohyphidae	Tricorythodes	4
Upper New Channel	5/1/2024	Spring	Insecta	Lepidoptera	Crambidae	Crambidae	1

Upper New Channel	5/1/2024	Spring	Insecta	Odonata	Coenagrionidae	Argia	3
Upper New Channel	5/1/2024	Spring	Insecta	Odonata	Coenagrionidae	Enallagma	2
Upper New Channel	5/1/2024	Spring	Insecta	Trichoptera	Glossosomatidae	Protoptila	2
Upper New Channel	5/1/2024	Spring	Insecta	Trichoptera	Helicopsychidae	Helicopsyche	22
Upper New Channel	5/1/2024	Spring	Insecta	Trichoptera	Leptoceridae	Nectopsyche	2
Upper New Channel	5/1/2024	Spring	Insecta	Trichoptera	Philopotamidae	Chimarra	2
Upper New Channel	5/1/2024	Spring	Insecta	Trichoptera	Rhyacophilidae	Rhyacophila	2
Upper New Channel	5/1/2024	Spring		Tricladida	Dugesiidae	Dugesia	4
Upper New Channel	5/1/2024	Spring	Gastropoda		Physidae	Physella	2
Upper New Channel	5/1/2024	Spring	Gastropoda		Planorbidae	Planorbella	1
Upper New Channel	5/1/2024	Spring	Gastropoda		Pleuroceridae	Elimia	17
Upper New Channel	5/1/2024	Spring	Gastropoda		Thiaridae	Melanoides tuberculata	5
Upper New Channel	5/1/2024	Spring	Clitellata			Hirudinea	3
Upper New Channel	5/1/2024	Spring	Clitellata			Oligochaeta	1
Upper New Channel	10/23/2024	Fall	Malacostraca	Amphipoda	Hyalellidae	Hyalella	40
Upper New Channel	10/23/2024	Fall	Insecta	Coleoptera	Elmidae	Macrelmis	2
Upper New Channel	10/23/2024	Fall	Insecta	Coleoptera	Psephenidae	Psephenus texanus	3

Upper New Channel	10/23/2024	Fall	Malacostraca	Decapoda	Palaemonidae	Palaemon	1
Upper New Channel	10/23/2024	Fall	Insecta	Diptera	Chironomidae	Chironomidae	15
Upper New Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Baetidae	Baetis	15
Upper New Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Baetidae	Baetodes	1
Upper New Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Leptohyphidae	Tricorythodes	4
Upper New Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Leptophlebiidae	Thraulodes	2
Upper New Channel	10/23/2024	Fall	Insecta	Hemiptera	Naucoridae	Ambrysus	3
Upper New Channel	10/23/2024	Fall	Annelida	Hirudinea	Glossosiphonidae	Glossosiphonidae	1
Upper New Channel	10/23/2024	Fall	Insecta	Odonata	Coenagrionidae	Argia	12
Upper New Channel	10/23/2024	Fall	Insecta	Odonata	Coenagrionidae	Enallagma	2
Upper New Channel	10/23/2024	Fall	Insecta	Odonata	Libellulidae	Libellulidae	1
Upper New Channel	10/23/2024	Fall	Insecta	Trichoptera	Glossosomatidae	Protoptila	1
Upper New Channel	10/23/2024	Fall	Insecta	Trichoptera	Helicopsychidae	Helicopsyche	21
Upper New Channel	10/23/2024	Fall	Insecta	Trichoptera	Leptoceridae	Nectopsyche	2
Upper New Channel	10/23/2024	Fall	Insecta	Trichoptera	Philopotamidae	Chimarra	13
Upper New Channel	10/23/2024	Fall	Gastropoda		Physidae	Physella	1
Upper New Channel	10/23/2024	Fall	Gastropoda		Pleuroceridae	Elimia	2

Upper New Channel	10/23/2024	Fall	Gastropoda		Thiaridae	Melanoides tuberculata	19
Lower New Channel	5/1/2024	Spring	Malacostraca	Amphipoda	Hyalellidae	Hyalella	5
Lower New Channel	5/1/2024	Spring	Insecta	Ephemeroptera	Baetidae	Callibaetis	3
Lower New Channel	5/1/2024	Spring	Insecta	Ephemeroptera	Leptohyphidae	Leptohyphes	2
Lower New Channel	5/1/2024	Spring	Insecta	Ephemeroptera	Leptohyphidae	Tricorythodes	25
Lower New Channel	5/1/2024	Spring	Gastropoda	Littorinimorpha	Hydrobiidae	Hydrobiidae	6
Lower New Channel	5/1/2024	Spring	Insecta	Odonata	Coenagrionidae	Argia	1
Lower New Channel	5/1/2024	Spring	Insecta	Odonata	Coenagrionidae	Enallagma	1
Lower New Channel	5/1/2024	Spring	Insecta	Trichoptera	Helicopsychidae	Helicopsyche	4
Lower New Channel	5/1/2024	Spring	Insecta	Trichoptera	Leptoceridae	Nectopsyche	26
Lower New Channel	5/1/2024	Spring	Gastropoda		Thiaridae	Melanoides tuberculata	80
Lower New Channel	5/1/2024	Spring	Clitellata			Oligochaeta	3
Lower New Channel	10/23/2024	Fall	Malacostraca	Amphipoda	Hyalellidae	Hyalella	40
Lower New Channel	10/23/2024	Fall	Insecta	Coleoptera	Haliplidae	Peltodytes	2
Lower New Channel	10/23/2024	Fall	Malacostraca	Decapoda	Cambaridae	Cambaridae	1
Lower New Channel	10/23/2024	Fall	Insecta	Diptera	Chironomidae	Chironomidae	1
Lower New Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Baetidae	Callibaetis	9

Lower New Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Caenidae	Caenis	1
Lower New Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Leptohyphidae	Leptohyphes	8
Lower New Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Leptohyphidae	Tricorythodes	29
Lower New Channel	10/23/2024	Fall	Insecta	Ephemeroptera	Leptophlebiidae	Thraulodes	3
Lower New Channel	10/23/2024	Fall	Insecta	Odonata	Aeshnidae	Basiaeschna	1
Lower New Channel	10/23/2024	Fall	Insecta	Odonata	Calopterygidae	Hetaerina	1
Lower New Channel	10/23/2024	Fall	Insecta	Odonata	Coenagrionidae	Argia	8
Lower New Channel	10/23/2024	Fall	Insecta	Trichoptera	Helicopsychidae	Helicopsyche	2
Lower New Channel	10/23/2024	Fall	Insecta	Trichoptera	Leptoceridae	Nectopsyche	2
Lower New Channel	10/23/2024	Fall	Gastropoda		Thiaridae	Melanoides tuberculata	54
Lower New Channel	10/23/2024	Fall	Clitellata			Oligochaeta	1

APPENDIX G: DROP-NET RAW DATA

SiteCode	Reach	Site_No	Date	Dip_Net	Species	Length	Count
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	26	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	29	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	24	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	35	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	25	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	24	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	18	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	21	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	36	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	25	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	25	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	20	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	24	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	25	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	21	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	24	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Dionda nigrotaeniata	25	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Herichthys cyanoguttatus	71	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Herichthys cyanoguttatus	24	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Micropterus salmoides	49	1
3133	Upper Spring Run	Algae-1	2024-04-30	1	Palaemonetes sp.		3
3133	Upper Spring Run	Algae-1	2024-04-30	2	Dionda nigrotaeniata	22	1
3133	Upper Spring Run	Algae-1	2024-04-30	2	Dionda nigrotaeniata	24	1
3133	Upper Spring Run	Algae-1	2024-04-30	2	Dionda nigrotaeniata	23	1
3133	Upper Spring Run	Algae-1	2024-04-30	2	Dionda nigrotaeniata	24	1
3133	Upper Spring Run	Algae-1	2024-04-30	2	Dionda nigrotaeniata	34	1
3133	Upper Spring Run	Algae-1	2024-04-30	2	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	2	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	2	Dionda nigrotaeniata		1

3133	Upper Spring Run	Algae-1	2024-04-30	2	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	2	Etheostoma fonticola	30	1
3133	Upper Spring Run	Algae-1	2024-04-30	2	Etheostoma fonticola	28	1
3133	Upper Spring Run	Algae-1	2024-04-30	2	Etheostoma fonticola	30	1
3133	Upper Spring Run	Algae-1	2024-04-30	2	Astyanax mexicanus	34	1
3133	Upper Spring Run	Algae-1	2024-04-30	2	Lepomis miniatus	29	1
3133	Upper Spring Run	Algae-1	2024-04-30	2	Lepomis miniatus	28	1
3133	Upper Spring Run	Algae-1	2024-04-30	3	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	3	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	3	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	3	Palaemonetes sp.		2
3133	Upper Spring Run	Algae-1	2024-04-30	3	Procambarus sp.		1
3133	Upper Spring Run	Algae-1	2024-04-30	3	Lepomis miniatus	36	1
3133	Upper Spring Run	Algae-1	2024-04-30	3	Micropterus salmoides	43	1
3133	Upper Spring Run	Algae-1	2024-04-30	3	Astyanax mexicanus	15	1
3133	Upper Spring Run	Algae-1	2024-04-30	4	Lepomis miniatus	87	1
3133	Upper Spring Run	Algae-1	2024-04-30	4	Etheostoma fonticola	25	1
3133	Upper Spring Run	Algae-1	2024-04-30	4	Etheostoma fonticola	25	1
3133	Upper Spring Run	Algae-1	2024-04-30	4	Etheostoma fonticola	29	1
3133	Upper Spring Run	Algae-1	2024-04-30	4	Etheostoma fonticola	25	1
3133	Upper Spring Run	Algae-1	2024-04-30	4	Etheostoma fonticola	32	1
3133	Upper Spring Run	Algae-1	2024-04-30	4	Etheostoma fonticola	24	1
3133	Upper Spring Run	Algae-1	2024-04-30	4	Palaemonetes sp.		4
3133	Upper Spring Run	Algae-1	2024-04-30	4	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	4	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	4	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	4	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	4	Micropterus salmoides	44	1
3133	Upper Spring Run	Algae-1	2024-04-30	4	Micropterus salmoides	43	1
3133	Upper Spring Run	Algae-1	2024-04-30	4	Astyanax mexicanus	34	1

3133	Upper Spring Run	Algae-1	2024-04-30	5	Micropterus salmoides	45	1
3133	Upper Spring Run	Algae-1	2024-04-30	5	Micropterus salmoides	42	1
3133	Upper Spring Run	Algae-1	2024-04-30	5	Etheostoma lepidum	60	1
3133	Upper Spring Run	Algae-1	2024-04-30	5	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	5	Astyanax mexicanus	28	1
3133	Upper Spring Run	Algae-1	2024-04-30	5	Lepomis miniatus	32	1
3133	Upper Spring Run	Algae-1	2024-04-30	6	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	6	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	6	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	6	Micropterus salmoides	55	1
3133	Upper Spring Run	Algae-1	2024-04-30	6	Astyanax mexicanus	22	1
3133	Upper Spring Run	Algae-1	2024-04-30	6	Palaemonetes sp.		2
3133	Upper Spring Run	Algae-1	2024-04-30	7	Etheostoma fonticola	32	1
3133	Upper Spring Run	Algae-1	2024-04-30	7	Etheostoma fonticola	31	1
3133	Upper Spring Run	Algae-1	2024-04-30	7	Etheostoma fonticola	30	1
3133	Upper Spring Run	Algae-1	2024-04-30	7	Etheostoma fonticola	27	1
3133	Upper Spring Run	Algae-1	2024-04-30	7	Etheostoma fonticola	28	1
3133	Upper Spring Run	Algae-1	2024-04-30	7	Herichthys cyanoguttatus	20	1
3133	Upper Spring Run	Algae-1	2024-04-30	7	Lepomis miniatus	30	1
3133	Upper Spring Run	Algae-1	2024-04-30	7	Lepomis miniatus	36	1
3133	Upper Spring Run	Algae-1	2024-04-30	7	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	7	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	7	Micropterus salmoides	48	1
3133	Upper Spring Run	Algae-1	2024-04-30	7	Palaemonetes sp.		1
3133	Upper Spring Run	Algae-1	2024-04-30	8	Procambarus sp.		1
3133	Upper Spring Run	Algae-1	2024-04-30	8	Micropterus salmoides	45	1
3133	Upper Spring Run	Algae-1	2024-04-30	8	Etheostoma fonticola	26	1
3133	Upper Spring Run	Algae-1	2024-04-30	8	Etheostoma fonticola	27	1
3133	Upper Spring Run	Algae-1	2024-04-30	9	Etheostoma fonticola	26	1
3133	Upper Spring Run	Algae-1	2024-04-30	9	Etheostoma fonticola	34	1

3133	Upper Spring Run	Algae-1	2024-04-30	9	Etheostoma fonticola	30	1
3133	Upper Spring Run	Algae-1	2024-04-30	9	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	9	Palaemonetes sp.		2
3133	Upper Spring Run	Algae-1	2024-04-30	9	Micropterus salmoides	52	1
3133	Upper Spring Run	Algae-1	2024-04-30	9	Micropterus salmoides	41	1
3133	Upper Spring Run	Algae-1	2024-04-30	10	Procambarus sp.		1
3133	Upper Spring Run	Algae-1	2024-04-30	10	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	10	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	10	Etheostoma fonticola	28	1
3133	Upper Spring Run	Algae-1	2024-04-30	11	Dionda nigrotaeniata		1
3133	Upper Spring Run	Algae-1	2024-04-30	11	Micropterus salmoides	50	1
3133	Upper Spring Run	Algae-1	2024-04-30	12	Lepomis miniatus	26	1
3133	Upper Spring Run	Algae-1	2024-04-30	12	Lepomis miniatus	33	1
3133	Upper Spring Run	Algae-1	2024-04-30	13	Micropterus salmoides	57	1
3133	Upper Spring Run	Algae-1	2024-04-30	13	Herichthys cyanoguttatus	45	1
3133	Upper Spring Run	Algae-1	2024-04-30	14	No fish collected		
3133	Upper Spring Run	Algae-1	2024-04-30	15	No fish collected		
3134	Upper Spring Run	Sag-1	2024-04-30	1	Lepomis miniatus	140	1
3134	Upper Spring Run	Sag-1	2024-04-30	2	Procambarus sp.		1
3134	Upper Spring Run	Sag-1	2024-04-30	2	Herichthys cyanoguttatus	60	1
3134	Upper Spring Run	Sag-1	2024-04-30	3	Micropterus salmoides	60	1
3134	Upper Spring Run	Sag-1	2024-04-30	3	Herichthys cyanoguttatus	64	1
3134	Upper Spring Run	Sag-1	2024-04-30	4	Lepomis miniatus	80	1
3134	Upper Spring Run	Sag-1	2024-04-30	5	Lepomis miniatus	85	1
3134	Upper Spring Run	Sag-1	2024-04-30	6	No fish collected		
3134	Upper Spring Run	Sag-1	2024-04-30	7	Dionda nigrotaeniata	33	1
3134	Upper Spring Run	Sag-1	2024-04-30	8	No fish collected		
3134	Upper Spring Run	Sag-1	2024-04-30	9	No fish collected		
3134	Upper Spring Run	Sag-1	2024-04-30	10	Procambarus sp.		1
3134	Upper Spring Run	Sag-1	2024-04-30	11	Procambarus sp.		1

3134	Upper Spring Run	Sag-1	2024-04-30	12	No fish collected		
3134	Upper Spring Run	Sag-1	2024-04-30	13	Procambarus sp.		2
3134	Upper Spring Run	Sag-1	2024-04-30	14	Procambarus sp.		1
3134	Upper Spring Run	Sag-1	2024-04-30	15	No fish collected		
3135	Upper Spring Run	Sag-2	2024-04-30	1	Procambarus sp.		4
3135	Upper Spring Run	Sag-2	2024-04-30	1	Lepomis miniatus	76	1
3135	Upper Spring Run	Sag-2	2024-04-30	1	Lepomis miniatus	34	1
3135	Upper Spring Run	Sag-2	2024-04-30	1	Lepomis miniatus	22	1
3135	Upper Spring Run	Sag-2	2024-04-30	1	Lepomis sp.	14	1
3135	Upper Spring Run	Sag-2	2024-04-30	1	Lepomis sp.	17	1
3135	Upper Spring Run	Sag-2	2024-04-30	1	Lepomis sp.	15	1
3135	Upper Spring Run	Sag-2	2024-04-30	2	Procambarus sp.		1
3135	Upper Spring Run	Sag-2	2024-04-30	3	Procambarus sp.		3
3135	Upper Spring Run	Sag-2	2024-04-30	4	Procambarus sp.		3
3135	Upper Spring Run	Sag-2	2024-04-30	5	Procambarus sp.		1
3135	Upper Spring Run	Sag-2	2024-04-30	6	Procambarus sp.		1
3135	Upper Spring Run	Sag-2	2024-04-30	7	Procambarus sp.		4
3135	Upper Spring Run	Sag-2	2024-04-30	8	Lepomis miniatus	73	1
3135	Upper Spring Run	Sag-2	2024-04-30	9	No fish collected		
3135	Upper Spring Run	Sag-2	2024-04-30	10	Gambusia sp.	19	1
3135	Upper Spring Run	Sag-2	2024-04-30	11	No fish collected		
3135	Upper Spring Run	Sag-2	2024-04-30	12	Procambarus sp.		1
3135	Upper Spring Run	Sag-2	2024-04-30	13	No fish collected		
3135	Upper Spring Run	Sag-2	2024-04-30	14	No fish collected		
3135	Upper Spring Run	Sag-2	2024-04-30	15	Lepomis miniatus	95	1
3136	Upper Spring Run	Bryo-1	2024-04-30	1	Procambarus sp.		2
3136	Upper Spring Run	Bryo-1	2024-04-30	1	Etheostoma fonticola	24	1
3136	Upper Spring Run	Bryo-1	2024-04-30	1	Etheostoma fonticola	14	1
3136	Upper Spring Run	Bryo-1	2024-04-30	1	Etheostoma fonticola	21	1
3136	Upper Spring Run	Bryo-1	2024-04-30	2	Etheostoma fonticola	16	1

3136	Upper Spring Run	Bryo-1	2024-04-30	3	Procambarus sp.		1
3136	Upper Spring Run	Bryo-1	2024-04-30	3	Etheostoma fonticola	35	1
3136	Upper Spring Run	Bryo-1	2024-04-30	3	Etheostoma fonticola	21	1
3136	Upper Spring Run	Bryo-1	2024-04-30	4	Etheostoma fonticola	11	1
3136	Upper Spring Run	Bryo-1	2024-04-30	5	Etheostoma fonticola	22	1
3136	Upper Spring Run	Bryo-1	2024-04-30	5	Etheostoma fonticola	34	1
3136	Upper Spring Run	Bryo-1	2024-04-30	5	Etheostoma fonticola	10	1
3136	Upper Spring Run	Bryo-1	2024-04-30	6	Etheostoma fonticola	25	1
3136	Upper Spring Run	Bryo-1	2024-04-30	7	Etheostoma fonticola	25	1
3136	Upper Spring Run	Bryo-1	2024-04-30	7	Lepomis sp.	12	1
3136	Upper Spring Run	Bryo-1	2024-04-30	7	Lepomis sp.	12	1
3136	Upper Spring Run	Bryo-1	2024-04-30	8	No fish collected		
3136	Upper Spring Run	Bryo-1	2024-04-30	9	Procambarus sp.		1
3136	Upper Spring Run	Bryo-1	2024-04-30	10	Etheostoma fonticola	25	1
3136	Upper Spring Run	Bryo-1	2024-04-30	10	Etheostoma fonticola	22	1
3136	Upper Spring Run	Bryo-1	2024-04-30	11	Etheostoma fonticola	26	1
3136	Upper Spring Run	Bryo-1	2024-04-30	12	Etheostoma fonticola	31	1
3136	Upper Spring Run	Bryo-1	2024-04-30	13	No fish collected		
3136	Upper Spring Run	Bryo-1	2024-04-30	14	No fish collected		
3136	Upper Spring Run	Bryo-1	2024-04-30	15	No fish collected		
3137	Upper Spring Run	Algae-2	2024-04-30	1	Micropterus salmoides	59	1
3137	Upper Spring Run	Algae-2	2024-04-30	1	Micropterus salmoides	48	1
3137	Upper Spring Run	Algae-2	2024-04-30	1	Micropterus salmoides	47	1
3137	Upper Spring Run	Algae-2	2024-04-30	1	Dionda nigrotaeniata	25	1
3137	Upper Spring Run	Algae-2	2024-04-30	1	Dionda nigrotaeniata	32	1
3137	Upper Spring Run	Algae-2	2024-04-30	1	Dionda nigrotaeniata	27	1
3137	Upper Spring Run	Algae-2	2024-04-30	1	Dionda nigrotaeniata	32	1
3137	Upper Spring Run	Algae-2	2024-04-30	1	Dionda nigrotaeniata	30	1
3137	Upper Spring Run	Algae-2	2024-04-30	1	Dionda nigrotaeniata	12	1
3137	Upper Spring Run	Algae-2	2024-04-30	1	Palaemonetes sp.		6

3137	Upper Spring Run	Algae-2	2024-04-30	1	Lepomis miniatus	40	1
3137	Upper Spring Run	Algae-2	2024-04-30	1	Lepomis miniatus	23	1
3137	Upper Spring Run	Algae-2	2024-04-30	2	Dionda nigrotaeniata	35	1
3137	Upper Spring Run	Algae-2	2024-04-30	2	Dionda nigrotaeniata	29	1
3137	Upper Spring Run	Algae-2	2024-04-30	2	Astyanax mexicanus	44	1
3137	Upper Spring Run	Algae-2	2024-04-30	2	Lepomis miniatus	70	1
3137	Upper Spring Run	Algae-2	2024-04-30	2	Micropterus salmoides	52	1
3137	Upper Spring Run	Algae-2	2024-04-30	2	Micropterus salmoides	45	1
3137	Upper Spring Run	Algae-2	2024-04-30	2	Etheostoma fonticola	28	1
3137	Upper Spring Run	Algae-2	2024-04-30	2	Palaemonetes sp.		2
3137	Upper Spring Run	Algae-2	2024-04-30	2	Gambusia sp.	11	1
3137	Upper Spring Run	Algae-2	2024-04-30	3	Lepomis miniatus	116	1
3137	Upper Spring Run	Algae-2	2024-04-30	3	Lepomis miniatus	28	1
3137	Upper Spring Run	Algae-2	2024-04-30	3	Astyanax mexicanus	53	1
3137	Upper Spring Run	Algae-2	2024-04-30	3	Dionda nigrotaeniata	22	1
3137	Upper Spring Run	Algae-2	2024-04-30	3	Dionda nigrotaeniata	18	1
3137	Upper Spring Run	Algae-2	2024-04-30	3	Dionda nigrotaeniata	28	1
3137	Upper Spring Run	Algae-2	2024-04-30	3	Micropterus salmoides	35	1
3137	Upper Spring Run	Algae-2	2024-04-30	3	Micropterus salmoides	38	1
3137	Upper Spring Run	Algae-2	2024-04-30	3	Micropterus salmoides	45	1
3137	Upper Spring Run	Algae-2	2024-04-30	3	Etheostoma fonticola	24	1
3137	Upper Spring Run	Algae-2	2024-04-30	3	Etheostoma fonticola	16	1
3137	Upper Spring Run	Algae-2	2024-04-30	3	Palaemonetes sp.		3
3137	Upper Spring Run	Algae-2	2024-04-30	3	Gambusia sp.	10	1
3137	Upper Spring Run	Algae-2	2024-04-30	4	Lepomis miniatus	85	1
3137	Upper Spring Run	Algae-2	2024-04-30	4	Lepomis miniatus	105	1
3137	Upper Spring Run	Algae-2	2024-04-30	4	Astyanax mexicanus	46	1
3137	Upper Spring Run	Algae-2	2024-04-30	4	Astyanax mexicanus	40	1
3137	Upper Spring Run	Algae-2	2024-04-30	4	Astyanax mexicanus	40	1
3137	Upper Spring Run	Algae-2	2024-04-30	4	Etheostoma fonticola	22	1

3137	Upper Spring Run	Algae-2	2024-04-30	4	Dionda nigrotaeniata	20	1
3137	Upper Spring Run	Algae-2	2024-04-30	4	Dionda nigrotaeniata	30	1
3137	Upper Spring Run	Algae-2	2024-04-30	4	Dionda nigrotaeniata	30	1
3137	Upper Spring Run	Algae-2	2024-04-30	4	Dionda nigrotaeniata	29	1
3137	Upper Spring Run	Algae-2	2024-04-30	4	Palaemonetes sp.		2
3137	Upper Spring Run	Algae-2	2024-04-30	5	Astyanax mexicanus	50	1
3137	Upper Spring Run	Algae-2	2024-04-30	5	Astyanax mexicanus	59	1
3137	Upper Spring Run	Algae-2	2024-04-30	5	Herichthys cyanoguttatus	66	1
3137	Upper Spring Run	Algae-2	2024-04-30	5	Palaemonetes sp.		3
3137	Upper Spring Run	Algae-2	2024-04-30	5	Micropterus salmoides	38	1
3137	Upper Spring Run	Algae-2	2024-04-30	5	Lepomis miniatus	27	1
3137	Upper Spring Run	Algae-2	2024-04-30	5	Dionda nigrotaeniata	22	1
3137	Upper Spring Run	Algae-2	2024-04-30	5	Etheostoma fonticola	27	1
3137	Upper Spring Run	Algae-2	2024-04-30	6	Dionda nigrotaeniata	30	1
3137	Upper Spring Run	Algae-2	2024-04-30	6	Dionda nigrotaeniata	31	1
3137	Upper Spring Run	Algae-2	2024-04-30	6	Dionda nigrotaeniata	25	1
3137	Upper Spring Run	Algae-2	2024-04-30	6	Dionda nigrotaeniata	30	1
3137	Upper Spring Run	Algae-2	2024-04-30	6	Dionda nigrotaeniata	26	1
3137	Upper Spring Run	Algae-2	2024-04-30	6	Dionda nigrotaeniata	22	1
3137	Upper Spring Run	Algae-2	2024-04-30	6	Dionda nigrotaeniata	23	1
3137	Upper Spring Run	Algae-2	2024-04-30	6	Dionda nigrotaeniata		1
3137	Upper Spring Run	Algae-2	2024-04-30	6	Palaemonetes sp.		2
3137	Upper Spring Run	Algae-2	2024-04-30	6	Lepomis miniatus	35	1
3137	Upper Spring Run	Algae-2	2024-04-30	6	Lepomis miniatus	87	1
3137	Upper Spring Run	Algae-2	2024-04-30	6	Lepomis miniatus	32	1
3137	Upper Spring Run	Algae-2	2024-04-30	7	Etheostoma lepidum	58	1
3137	Upper Spring Run	Algae-2	2024-04-30	7	Etheostoma fonticola	15	1
3137	Upper Spring Run	Algae-2	2024-04-30	7	Palaemonetes sp.		1
3137	Upper Spring Run	Algae-2	2024-04-30	8	Lepomis miniatus	142	1
3137	Upper Spring Run	Algae-2	2024-04-30	8	Lepomis miniatus	73	1

3137	Upper Spring Run	Algae-2	2024-04-30	8	Lepomis miniatus	31	1
3137	Upper Spring Run	Algae-2	2024-04-30	8	Lepomis miniatus	27	1
3137	Upper Spring Run	Algae-2	2024-04-30	8	Lepomis miniatus	31	1
3137	Upper Spring Run	Algae-2	2024-04-30	8	Lepomis miniatus	24	1
3137	Upper Spring Run	Algae-2	2024-04-30	8	Lepomis miniatus	26	1
3137	Upper Spring Run	Algae-2	2024-04-30	8	Herichthys cyanoguttatus	53	1
3137	Upper Spring Run	Algae-2	2024-04-30	8	Etheostoma fonticola	23	1
3137	Upper Spring Run	Algae-2	2024-04-30	8	Etheostoma fonticola	19	1
3137	Upper Spring Run	Algae-2	2024-04-30	8	Etheostoma fonticola	26	1
3137	Upper Spring Run	Algae-2	2024-04-30	8	Dionda nigrotaeniata		1
3137	Upper Spring Run	Algae-2	2024-04-30	8	Lepomis sp.	18	1
3137	Upper Spring Run	Algae-2	2024-04-30	8	Palaemonetes sp.		1
3137	Upper Spring Run	Algae-2	2024-04-30	9	Palaemonetes sp.		1
3137	Upper Spring Run	Algae-2	2024-04-30	9	Etheostoma fonticola	25	1
3137	Upper Spring Run	Algae-2	2024-04-30	10	Lepomis sp.	16	1
3137	Upper Spring Run	Algae-2	2024-04-30	10	Gambusia sp.	10	1
3137	Upper Spring Run	Algae-2	2024-04-30	11	Etheostoma fonticola	29	1
3137	Upper Spring Run	Algae-2	2024-04-30	11	Gambusia sp.	18	1
3137	Upper Spring Run	Algae-2	2024-04-30	11	Gambusia sp.	14	1
3137	Upper Spring Run	Algae-2	2024-04-30	12	Etheostoma fonticola	25	1
3137	Upper Spring Run	Algae-2	2024-04-30	12	Etheostoma fonticola	26	1
3137	Upper Spring Run	Algae-2	2024-04-30	12	Dionda nigrotaeniata		1
3137	Upper Spring Run	Algae-2	2024-04-30	12	Lepomis miniatus	30	1
3137	Upper Spring Run	Algae-2	2024-04-30	12	Lepomis miniatus	29	1
3137	Upper Spring Run	Algae-2	2024-04-30	12	Palaemonetes sp.		1
3137	Upper Spring Run	Algae-2	2024-04-30	13	Lepomis miniatus	71	1
3137	Upper Spring Run	Algae-2	2024-04-30	13	Astyanax mexicanus	55	1
3137	Upper Spring Run	Algae-2	2024-04-30	13	Herichthys cyanoguttatus	33	1
3137	Upper Spring Run	Algae-2	2024-04-30	13	Micropterus salmoides	46	1
3137	Upper Spring Run	Algae-2	2024-04-30	13	Dionda nigrotaeniata		1

3137	Upper Spring Run	Algae-2	2024-04-30	13	Etheostoma fonticola	27	1
3137	Upper Spring Run	Algae-2	2024-04-30	14	Lepomis miniatus	41	1
3137	Upper Spring Run	Algae-2	2024-04-30	15	No fish collected		
3138	Upper Spring Run	Bryo-2	2024-04-30	1	Etheostoma fonticola	18	1
3138	Upper Spring Run	Bryo-2	2024-04-30	2	Lepomis miniatus	30	1
3138	Upper Spring Run	Bryo-2	2024-04-30	3	No fish collected		
3138	Upper Spring Run	Bryo-2	2024-04-30	4	No fish collected		
3138	Upper Spring Run	Bryo-2	2024-04-30	5	No fish collected		
3138	Upper Spring Run	Bryo-2	2024-04-30	6	No fish collected		
3138	Upper Spring Run	Bryo-2	2024-04-30	7	No fish collected		
3138	Upper Spring Run	Bryo-2	2024-04-30	8	No fish collected		
3138	Upper Spring Run	Bryo-2	2024-04-30	9	No fish collected		
3138	Upper Spring Run	Bryo-2	2024-04-30	10	Lepomis miniatus	20	1
3138	Upper Spring Run	Bryo-2	2024-04-30	11	No fish collected		
3138	Upper Spring Run	Bryo-2	2024-04-30	12	No fish collected		
3138	Upper Spring Run	Bryo-2	2024-04-30	13	No fish collected		
3138	Upper Spring Run	Bryo-2	2024-04-30	14	No fish collected		
3138	Upper Spring Run	Bryo-2	2024-04-30	15	Etheostoma fonticola	25	1
3138	Upper Spring Run	Bryo-2	2024-04-30	16	No fish collected		
3139	Upper Spring Run	Open-1	2024-04-30	1	No fish collected		
3139	Upper Spring Run	Open-1	2024-04-30	2	No fish collected		
3139	Upper Spring Run	Open-1	2024-04-30	3	No fish collected		
3139	Upper Spring Run	Open-1	2024-04-30	4	Etheostoma fonticola	34	1
3139	Upper Spring Run	Open-1	2024-04-30	5	No fish collected		
3139	Upper Spring Run	Open-1	2024-04-30	6	No fish collected		
3139	Upper Spring Run	Open-1	2024-04-30	7	No fish collected		
3139	Upper Spring Run	Open-1	2024-04-30	8	No fish collected		
3139	Upper Spring Run	Open-1	2024-04-30	9	No fish collected		
3139	Upper Spring Run	Open-1	2024-04-30	10	No fish collected		
3139	Upper Spring Run	Open-1	2024-04-30	11	Etheostoma fonticola	22	1

3139	Upper Spring Run	Open-1	2024-04-30	11	Etheostoma fonticola	16	1
3139	Upper Spring Run	Open-1	2024-04-30	11	Etheostoma fonticola	13	1
3139	Upper Spring Run	Open-1	2024-04-30	11	Etheostoma fonticola	16	1
3139	Upper Spring Run	Open-1	2024-04-30	11	Etheostoma fonticola	14	1
3139	Upper Spring Run	Open-1	2024-04-30	12	Etheostoma fonticola	18	1
3139	Upper Spring Run	Open-1	2024-04-30	13	Etheostoma fonticola	23	1
3139	Upper Spring Run	Open-1	2024-04-30	13	Etheostoma lepidum	25	1
3139	Upper Spring Run	Open-1	2024-04-30	14	No fish collected		
3139	Upper Spring Run	Open-1	2024-04-30	15	No fish collected		
3140	Upper Spring Run	Open-2	2024-04-30	1	No fish collected		
3140	Upper Spring Run	Open-2	2024-04-30	2	No fish collected		
3140	Upper Spring Run	Open-2	2024-04-30	3	No fish collected		
3140	Upper Spring Run	Open-2	2024-04-30	4	No fish collected		
3140	Upper Spring Run	Open-2	2024-04-30	5	Etheostoma lepidum	39	1
3140	Upper Spring Run	Open-2	2024-04-30	6	No fish collected		
3140	Upper Spring Run	Open-2	2024-04-30	7	No fish collected		
3140	Upper Spring Run	Open-2	2024-04-30	8	No fish collected		
3140	Upper Spring Run	Open-2	2024-04-30	9	No fish collected		
3140	Upper Spring Run	Open-2	2024-04-30	10	No fish collected		
3140	Upper Spring Run	Open-2	2024-04-30	11	No fish collected		
3140	Upper Spring Run	Open-2	2024-04-30	12	No fish collected		
3140	Upper Spring Run	Open-2	2024-04-30	13	No fish collected		
3140	Upper Spring Run	Open-2	2024-04-30	14	No fish collected		
3140	Upper Spring Run	Open-2	2024-04-30	15	No fish collected		
3141	Landa Lake	Sag-1	2024-04-25	1	Procambarus sp.		1
3141	Landa Lake	Sag-1	2024-04-25	1	Astyanax mexicanus	24	1
3141	Landa Lake	Sag-1	2024-04-25	1	Astyanax mexicanus	37	1
3141	Landa Lake	Sag-1	2024-04-25	1	Astyanax mexicanus	21	1
3141	Landa Lake	Sag-1	2024-04-25	1	Astyanax mexicanus	20	1
3141	Landa Lake	Sag-1	2024-04-25	1	Astyanax mexicanus	18	1

3141	Landa Lake	Sag-1	2024-04-25	1	Astyanax mexicanus	17	1
3141	Landa Lake	Sag-1	2024-04-25	1	Lepomis miniatus	25	1
3141	Landa Lake	Sag-1	2024-04-25	1	Lepomis miniatus	26	1
3141	Landa Lake	Sag-1	2024-04-25	1	Lepomis sp.	18	1
3141	Landa Lake	Sag-1	2024-04-25	1	Lepomis sp.	17	1
3141	Landa Lake	Sag-1	2024-04-25	1	Lepomis sp.	18	1
3141	Landa Lake	Sag-1	2024-04-25	1	Lepomis sp.	10	1
3141	Landa Lake	Sag-1	2024-04-25	2	Lepomis sp.	19	1
3141	Landa Lake	Sag-1	2024-04-25	2	Procambarus sp.		1
3141	Landa Lake	Sag-1	2024-04-25	2	Astyanax mexicanus	29	1
3141	Landa Lake	Sag-1	2024-04-25	2	Astyanax mexicanus	32	1
3141	Landa Lake	Sag-1	2024-04-25	2	Astyanax mexicanus	26	1
3141	Landa Lake	Sag-1	2024-04-25	3	Micropterus salmoides	39	1
3141	Landa Lake	Sag-1	2024-04-25	3	Lepomis sp.	19	1
3141	Landa Lake	Sag-1	2024-04-25	3	Lepomis sp.	15	1
3141	Landa Lake	Sag-1	2024-04-25	4	Procambarus sp.		1
3141	Landa Lake	Sag-1	2024-04-25	4	Astyanax mexicanus	24	1
3141	Landa Lake	Sag-1	2024-04-25	5	Lepomis miniatus	24	1
3141	Landa Lake	Sag-1	2024-04-25	6	Lepomis miniatus	28	1
3141	Landa Lake	Sag-1	2024-04-25	6	Astyanax mexicanus	30	1
3141	Landa Lake	Sag-1	2024-04-25	6	Gambusia sp.	11	1
3141	Landa Lake	Sag-1	2024-04-25	7	Procambarus sp.		1
3141	Landa Lake	Sag-1	2024-04-25	8	No fish collected		
3141	Landa Lake	Sag-1	2024-04-25	9	No fish collected		
3141	Landa Lake	Sag-1	2024-04-25	10	No fish collected		
3141	Landa Lake	Sag-1	2024-04-25	11	No fish collected		
3141	Landa Lake	Sag-1	2024-04-25	12	No fish collected		
3141	Landa Lake	Sag-1	2024-04-25	13	No fish collected		
3141	Landa Lake	Sag-1	2024-04-25	14	No fish collected		
3141	Landa Lake	Sag-1	2024-04-25	15	No fish collected		

3142	Landa Lake	Sag-2	2024-04-25	1	Procambarus sp.		1
3142	Landa Lake	Sag-2	2024-04-25	1	Micropterus salmoides	56	1
3142	Landa Lake	Sag-2	2024-04-25	1	Micropterus salmoides	36	1
3142	Landa Lake	Sag-2	2024-04-25	1	Lepomis miniatus	60	1
3142	Landa Lake	Sag-2	2024-04-25	1	Lepomis miniatus	41	1
3142	Landa Lake	Sag-2	2024-04-25	1	Lepomis miniatus	24	1
3142	Landa Lake	Sag-2	2024-04-25	1	Lepomis miniatus	25	1
3142	Landa Lake	Sag-2	2024-04-25	1	Lepomis miniatus	28	1
3142	Landa Lake	Sag-2	2024-04-25	1	Lepomis miniatus	23	1
3142	Landa Lake	Sag-2	2024-04-25	1	Astyanax mexicanus	35	1
3142	Landa Lake	Sag-2	2024-04-25	1	Astyanax mexicanus	37	1
3142	Landa Lake	Sag-2	2024-04-25	1	Astyanax mexicanus	30	1
3142	Landa Lake	Sag-2	2024-04-25	1	Astyanax mexicanus	29	1
3142	Landa Lake	Sag-2	2024-04-25	1	Astyanax mexicanus	24	1
3142	Landa Lake	Sag-2	2024-04-25	1	Astyanax mexicanus	31	1
3142	Landa Lake	Sag-2	2024-04-25	1	Astyanax mexicanus	24	1
3142	Landa Lake	Sag-2	2024-04-25	1	Astyanax mexicanus	26	1
3142	Landa Lake	Sag-2	2024-04-25	1	Lepomis sp.	20	1
3142	Landa Lake	Sag-2	2024-04-25	1	Lepomis sp.	20	1
3142	Landa Lake	Sag-2	2024-04-25	1	Palaemonetes sp.		1
3142	Landa Lake	Sag-2	2024-04-25	2	Procambarus sp.		1
3142	Landa Lake	Sag-2	2024-04-25	2	Astyanax mexicanus	26	1
3142	Landa Lake	Sag-2	2024-04-25	2	Astyanax mexicanus	26	1
3142	Landa Lake	Sag-2	2024-04-25	2	Lepomis miniatus	41	1
3142	Landa Lake	Sag-2	2024-04-25	2	Lepomis miniatus	25	1
3142	Landa Lake	Sag-2	2024-04-25	2	Lepomis miniatus	38	1
3142	Landa Lake	Sag-2	2024-04-25	2	Lepomis sp.	17	1
3142	Landa Lake	Sag-2	2024-04-25	3	Astyanax mexicanus	23	1
3142	Landa Lake	Sag-2	2024-04-25	4	No fish collected		
3142	Landa Lake	Sag-2	2024-04-25	5	Astyanax mexicanus	18	1

3142	Landa Lake	Sag-2	2024-04-25	5	Astyanax mexicanus	24	1
3142	Landa Lake	Sag-2	2024-04-25	5	Astyanax mexicanus	25	1
3142	Landa Lake	Sag-2	2024-04-25	5	Lepomis miniatus	26	1
3142	Landa Lake	Sag-2	2024-04-25	6	No fish collected		
3142	Landa Lake	Sag-2	2024-04-25	7	No fish collected		
3142	Landa Lake	Sag-2	2024-04-25	8	No fish collected		
3142	Landa Lake	Sag-2	2024-04-25	9	Lepomis miniatus	32	1
3142	Landa Lake	Sag-2	2024-04-25	10	No fish collected		
3142	Landa Lake	Sag-2	2024-04-25	11	No fish collected		
3142	Landa Lake	Sag-2	2024-04-25	12	Lepomis miniatus	24	1
3142	Landa Lake	Sag-2	2024-04-25	12	Astyanax mexicanus	17	1
3142	Landa Lake	Sag-2	2024-04-25	13	No fish collected		
3142	Landa Lake	Sag-2	2024-04-25	14	No fish collected		
3142	Landa Lake	Sag-2	2024-04-25	15	No fish collected		
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	28	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	25	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	34	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	25	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	24	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	14	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	25	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	24	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	24	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	18	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	24	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	23	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	18	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	16	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	23	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	27	1

3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	21	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	20	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	19	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	18	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	17	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	16	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	23	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	24	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	15	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	21	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	16	1
3143	Landa Lake	Cab-1	2024-04-25	1	Etheostoma fonticola	15	1
3143	Landa Lake	Cab-1	2024-04-25	1	Procambarus sp.		2
3143	Landa Lake	Cab-1	2024-04-25	1	Palaemonetes sp.		8
3143	Landa Lake	Cab-1	2024-04-25	1	Gambusia sp.	11	1
3143	Landa Lake	Cab-1	2024-04-25	2	Procambarus sp.		3
3143	Landa Lake	Cab-1	2024-04-25	2	Etheostoma fonticola	38	1
3143	Landa Lake	Cab-1	2024-04-25	2	Etheostoma fonticola	18	1
3143	Landa Lake	Cab-1	2024-04-25	2	Etheostoma fonticola	20	1
3143	Landa Lake	Cab-1	2024-04-25	2	Etheostoma fonticola	18	1
3143	Landa Lake	Cab-1	2024-04-25	2	Etheostoma fonticola	23	1
3143	Landa Lake	Cab-1	2024-04-25	2	Etheostoma fonticola	20	1
3143	Landa Lake	Cab-1	2024-04-25	2	Etheostoma fonticola	21	1
3143	Landa Lake	Cab-1	2024-04-25	2	Etheostoma fonticola	20	1
3143	Landa Lake	Cab-1	2024-04-25	2	Etheostoma fonticola	28	1
3143	Landa Lake	Cab-1	2024-04-25	2	Palaemonetes sp.		4
3143	Landa Lake	Cab-1	2024-04-25	3	Palaemonetes sp.		6
3143	Landa Lake	Cab-1	2024-04-25	3	Etheostoma fonticola	24	1
3143	Landa Lake	Cab-1	2024-04-25	3	Etheostoma fonticola	21	1
3143	Landa Lake	Cab-1	2024-04-25	3	Etheostoma fonticola	28	1

3143	Landa Lake	Cab-1	2024-04-25	3	Etheostoma fonticola	25	1
3143	Landa Lake	Cab-1	2024-04-25	3	Etheostoma fonticola	32	1
3143	Landa Lake	Cab-1	2024-04-25	3	Etheostoma fonticola	24	1
3143	Landa Lake	Cab-1	2024-04-25	3	Etheostoma fonticola	20	1
3143	Landa Lake	Cab-1	2024-04-25	3	Etheostoma fonticola	20	1
3143	Landa Lake	Cab-1	2024-04-25	3	Etheostoma fonticola	22	1
3143	Landa Lake	Cab-1	2024-04-25	3	Etheostoma fonticola	24	1
3143	Landa Lake	Cab-1	2024-04-25	3	Procambarus sp.		3
3143	Landa Lake	Cab-1	2024-04-25	3	Gambusia sp.	15	1
3143	Landa Lake	Cab-1	2024-04-25	4	Procambarus sp.		2
3143	Landa Lake	Cab-1	2024-04-25	4	Etheostoma fonticola	22	1
3143	Landa Lake	Cab-1	2024-04-25	4	Etheostoma fonticola	31	1
3143	Landa Lake	Cab-1	2024-04-25	4	Etheostoma fonticola	23	1
3143	Landa Lake	Cab-1	2024-04-25	4	Etheostoma fonticola	29	1
3143	Landa Lake	Cab-1	2024-04-25	4	Palaemonetes sp.		2
3143	Landa Lake	Cab-1	2024-04-25	5	Procambarus sp.		1
3143	Landa Lake	Cab-1	2024-04-25	5	Etheostoma fonticola	24	1
3143	Landa Lake	Cab-1	2024-04-25	5	Etheostoma fonticola	31	1
3143	Landa Lake	Cab-1	2024-04-25	5	Etheostoma fonticola	28	1
3143	Landa Lake	Cab-1	2024-04-25	5	Etheostoma fonticola	20	1
3143	Landa Lake	Cab-1	2024-04-25	5	Etheostoma fonticola	19	1
3143	Landa Lake	Cab-1	2024-04-25	6	Etheostoma fonticola	25	1
3143	Landa Lake	Cab-1	2024-04-25	6	Etheostoma fonticola	28	1
3143	Landa Lake	Cab-1	2024-04-25	6	Etheostoma fonticola	29	1
3143	Landa Lake	Cab-1	2024-04-25	6	Etheostoma fonticola	25	1
3143	Landa Lake	Cab-1	2024-04-25	6	Etheostoma fonticola	25	1
3143	Landa Lake	Cab-1	2024-04-25	6	Etheostoma fonticola	17	1
3143	Landa Lake	Cab-1	2024-04-25	6	Etheostoma fonticola	22	1
3143	Landa Lake	Cab-1	2024-04-25	6	Etheostoma fonticola	29	1
3143	Landa Lake	Cab-1	2024-04-25	6	Procambarus sp.		1

3143	Landa Lake	Cab-1	2024-04-25	6	Palaemonetes sp.		1
3143	Landa Lake	Cab-1	2024-04-25	7	Procambarus sp.		2
3143	Landa Lake	Cab-1	2024-04-25	8	Procambarus sp.		2
3143	Landa Lake	Cab-1	2024-04-25	8	Etheostoma fonticola	20	1
3143	Landa Lake	Cab-1	2024-04-25	8	Etheostoma fonticola	22	1
3143	Landa Lake	Cab-1	2024-04-25	8	Etheostoma fonticola	24	1
3143	Landa Lake	Cab-1	2024-04-25	8	Etheostoma fonticola	16	1
3143	Landa Lake	Cab-1	2024-04-25	8	Etheostoma fonticola	22	1
3143	Landa Lake	Cab-1	2024-04-25	8	Etheostoma fonticola	32	1
3143	Landa Lake	Cab-1	2024-04-25	8	Etheostoma fonticola	20	1
3143	Landa Lake	Cab-1	2024-04-25	8	Etheostoma fonticola	22	1
3143	Landa Lake	Cab-1	2024-04-25	8	Etheostoma fonticola	25	1
3143	Landa Lake	Cab-1	2024-04-25	8	Palaemonetes sp.		2
3143	Landa Lake	Cab-1	2024-04-25	9	Palaemonetes sp.		1
3143	Landa Lake	Cab-1	2024-04-25	9	Etheostoma fonticola	29	1
3143	Landa Lake	Cab-1	2024-04-25	9	Etheostoma fonticola	25	1
3143	Landa Lake	Cab-1	2024-04-25	9	Etheostoma fonticola	21	1
3143	Landa Lake	Cab-1	2024-04-25	9	Etheostoma fonticola	20	1
3143	Landa Lake	Cab-1	2024-04-25	9	Etheostoma fonticola	16	1
3143	Landa Lake	Cab-1	2024-04-25	9	Etheostoma fonticola	21	1
3143	Landa Lake	Cab-1	2024-04-25	9	Etheostoma fonticola	21	1
3143	Landa Lake	Cab-1	2024-04-25	10	Procambarus sp.		1
3143	Landa Lake	Cab-1	2024-04-25	10	Palaemonetes sp.		2
3143	Landa Lake	Cab-1	2024-04-25	10	Etheostoma fonticola	29	1
3143	Landa Lake	Cab-1	2024-04-25	10	Etheostoma fonticola	19	1
3143	Landa Lake	Cab-1	2024-04-25	10	Etheostoma fonticola	25	1
3143	Landa Lake	Cab-1	2024-04-25	11	Procambarus sp.		2
3143	Landa Lake	Cab-1	2024-04-25	11	Etheostoma fonticola	26	1
3143	Landa Lake	Cab-1	2024-04-25	11	Etheostoma fonticola	20	1
3143	Landa Lake	Cab-1	2024-04-25	11	Etheostoma fonticola	18	1

3143	Landa Lake	Cab-1	2024-04-25	11	Etheostoma fonticola	24	1
3143	Landa Lake	Cab-1	2024-04-25	12	Etheostoma fonticola	22	1
3143	Landa Lake	Cab-1	2024-04-25	12	Etheostoma fonticola	30	1
3143	Landa Lake	Cab-1	2024-04-25	12	Etheostoma fonticola	24	1
3143	Landa Lake	Cab-1	2024-04-25	12	Etheostoma fonticola	22	1
3143	Landa Lake	Cab-1	2024-04-25	12	Etheostoma fonticola	19	1
3143	Landa Lake	Cab-1	2024-04-25	13	No fish collected		
3143	Landa Lake	Cab-1	2024-04-25	14	Etheostoma fonticola	21	1
3143	Landa Lake	Cab-1	2024-04-25	14	Etheostoma fonticola	23	1
3143	Landa Lake	Cab-1	2024-04-25	15	Palaemonetes sp.		1
3144	Landa Lake	Cab-2	2024-04-25	1	Palaemonetes sp.		36
3144	Landa Lake	Cab-2	2024-04-25	1	Etheostoma fonticola	20	1
3144	Landa Lake	Cab-2	2024-04-25	1	Etheostoma fonticola	24	1
3144	Landa Lake	Cab-2	2024-04-25	1	Etheostoma fonticola	19	1
3144	Landa Lake	Cab-2	2024-04-25	1	Etheostoma fonticola	16	1
3144	Landa Lake	Cab-2	2024-04-25	1	Lepomis sp.	17	1
3144	Landa Lake	Cab-2	2024-04-25	1	Lepomis sp.	16	1
3144	Landa Lake	Cab-2	2024-04-25	1	Lepomis miniatus	49	1
3144	Landa Lake	Cab-2	2024-04-25	1	Micropterus salmoides	44	1
3144	Landa Lake	Cab-2	2024-04-25	2	Etheostoma fonticola	25	1
3144	Landa Lake	Cab-2	2024-04-25	2	Etheostoma fonticola	35	1
3144	Landa Lake	Cab-2	2024-04-25	2	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	2	Etheostoma fonticola	27	1
3144	Landa Lake	Cab-2	2024-04-25	2	Etheostoma fonticola	27	1
3144	Landa Lake	Cab-2	2024-04-25	2	Etheostoma fonticola	15	1
3144	Landa Lake	Cab-2	2024-04-25	2	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	2	Etheostoma fonticola	16	1
3144	Landa Lake	Cab-2	2024-04-25	2	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	2	Etheostoma fonticola	16	1
3144	Landa Lake	Cab-2	2024-04-25	2	Palaemonetes sp.		25

3144	Landa Lake	Cab-2	2024-04-25	2	Astyanax mexicanus	37	1
3144	Landa Lake	Cab-2	2024-04-25	2	Astyanax mexicanus	35	1
3144	Landa Lake	Cab-2	2024-04-25	2	Gambusia sp.	16	1
3144	Landa Lake	Cab-2	2024-04-25	2	Lepomis miniatus	28	1
3144	Landa Lake	Cab-2	2024-04-25	2	Lepomis miniatus	32	1
3144	Landa Lake	Cab-2	2024-04-25	3	Etheostoma fonticola	19	1
3144	Landa Lake	Cab-2	2024-04-25	3	Etheostoma fonticola	29	1
3144	Landa Lake	Cab-2	2024-04-25	3	Etheostoma fonticola	16	1
3144	Landa Lake	Cab-2	2024-04-25	3	Etheostoma fonticola	20	1
3144	Landa Lake	Cab-2	2024-04-25	3	Etheostoma fonticola	24	1
3144	Landa Lake	Cab-2	2024-04-25	3	Palaemonetes sp.		12
3144	Landa Lake	Cab-2	2024-04-25	3	Lepomis sp.	20	1
3144	Landa Lake	Cab-2	2024-04-25	4	Procambarus sp.		1
3144	Landa Lake	Cab-2	2024-04-25	4	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	4	Etheostoma fonticola	24	1
3144	Landa Lake	Cab-2	2024-04-25	4	Etheostoma fonticola	29	1
3144	Landa Lake	Cab-2	2024-04-25	4	Etheostoma fonticola	29	1
3144	Landa Lake	Cab-2	2024-04-25	4	Etheostoma fonticola	17	1
3144	Landa Lake	Cab-2	2024-04-25	4	Etheostoma fonticola	20	1
3144	Landa Lake	Cab-2	2024-04-25	4	Etheostoma fonticola	16	1
3144	Landa Lake	Cab-2	2024-04-25	4	Palaemonetes sp.		4
3144	Landa Lake	Cab-2	2024-04-25	5	Procambarus sp.		1
3144	Landa Lake	Cab-2	2024-04-25	5	Lepomis miniatus	32	1
3144	Landa Lake	Cab-2	2024-04-25	5	Palaemonetes sp.		7
3144	Landa Lake	Cab-2	2024-04-25	5	Etheostoma fonticola	22	1
3144	Landa Lake	Cab-2	2024-04-25	5	Etheostoma fonticola	17	1
3144	Landa Lake	Cab-2	2024-04-25	5	Etheostoma fonticola	18	1
3144	Landa Lake	Cab-2	2024-04-25	5	Etheostoma fonticola	16	1
3144	Landa Lake	Cab-2	2024-04-25	5	Etheostoma fonticola	25	1
3144	Landa Lake	Cab-2	2024-04-25	5	Etheostoma fonticola	21	1

3144	Landa Lake	Cab-2	2024-04-25	5	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	5	Etheostoma fonticola	18	1
3144	Landa Lake	Cab-2	2024-04-25	5	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	5	Etheostoma fonticola	18	1
3144	Landa Lake	Cab-2	2024-04-25	5	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	5	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	5	Etheostoma fonticola	22	1
3144	Landa Lake	Cab-2	2024-04-25	5	Etheostoma fonticola	16	1
3144	Landa Lake	Cab-2	2024-04-25	6	Etheostoma fonticola	28	1
3144	Landa Lake	Cab-2	2024-04-25	6	Etheostoma fonticola	16	1
3144	Landa Lake	Cab-2	2024-04-25	6	Etheostoma fonticola	18	1
3144	Landa Lake	Cab-2	2024-04-25	6	Etheostoma fonticola	33	1
3144	Landa Lake	Cab-2	2024-04-25	6	Etheostoma fonticola	24	1
3144	Landa Lake	Cab-2	2024-04-25	6	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	6	Etheostoma fonticola	22	1
3144	Landa Lake	Cab-2	2024-04-25	6	Etheostoma fonticola	26	1
3144	Landa Lake	Cab-2	2024-04-25	6	Palaemonetes sp.		5
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	26	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	29	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	23	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	15	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	27	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	31	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	19	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	30	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	25	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	16	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	18	1

3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	18	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	17	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	20	1
3144	Landa Lake	Cab-2	2024-04-25	7	Etheostoma fonticola	19	1
3144	Landa Lake	Cab-2	2024-04-25	7	Palaemonetes sp.		6
3144	Landa Lake	Cab-2	2024-04-25	7	Lepomis miniatus	20	1
3144	Landa Lake	Cab-2	2024-04-25	8	Procambarus sp.		2
3144	Landa Lake	Cab-2	2024-04-25	8	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	8	Etheostoma fonticola	16	1
3144	Landa Lake	Cab-2	2024-04-25	8	Etheostoma fonticola	19	1
3144	Landa Lake	Cab-2	2024-04-25	8	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	8	Etheostoma fonticola	19	1
3144	Landa Lake	Cab-2	2024-04-25	9	Palaemonetes sp.		1
3144	Landa Lake	Cab-2	2024-04-25	9	Etheostoma fonticola	24	1
3144	Landa Lake	Cab-2	2024-04-25	9	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	9	Lepomis sp.	19	1
3144	Landa Lake	Cab-2	2024-04-25	10	Procambarus sp.		1
3144	Landa Lake	Cab-2	2024-04-25	10	Lepomis miniatus	40	1
3144	Landa Lake	Cab-2	2024-04-25	10	Etheostoma fonticola	18	1
3144	Landa Lake	Cab-2	2024-04-25	10	Etheostoma fonticola	20	1
3144	Landa Lake	Cab-2	2024-04-25	10	Etheostoma fonticola	26	1
3144	Landa Lake	Cab-2	2024-04-25	10	Etheostoma fonticola	26	1
3144	Landa Lake	Cab-2	2024-04-25	10	Etheostoma fonticola	22	1
3144	Landa Lake	Cab-2	2024-04-25	10	Etheostoma fonticola	22	1
3144	Landa Lake	Cab-2	2024-04-25	10	Etheostoma fonticola	29	1
3144	Landa Lake	Cab-2	2024-04-25	10	Etheostoma fonticola	20	1
3144	Landa Lake	Cab-2	2024-04-25	10	Etheostoma fonticola	26	1
3144	Landa Lake	Cab-2	2024-04-25	10	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	10	Etheostoma fonticola	16	1
3144	Landa Lake	Cab-2	2024-04-25	10	Etheostoma fonticola	16	1

3144	Landa Lake	Cab-2	2024-04-25	10	Etheostoma fonticola	16	1
3144	Landa Lake	Cab-2	2024-04-25	10	Palaemonetes sp.		1
3144	Landa Lake	Cab-2	2024-04-25	11	Procambarus sp.		1
3144	Landa Lake	Cab-2	2024-04-25	11	Etheostoma fonticola	25	1
3144	Landa Lake	Cab-2	2024-04-25	11	Etheostoma fonticola	20	1
3144	Landa Lake	Cab-2	2024-04-25	11	Etheostoma fonticola	20	1
3144	Landa Lake	Cab-2	2024-04-25	11	Etheostoma fonticola	20	1
3144	Landa Lake	Cab-2	2024-04-25	11	Palaemonetes sp.		1
3144	Landa Lake	Cab-2	2024-04-25	12	Etheostoma fonticola	16	1
3144	Landa Lake	Cab-2	2024-04-25	12	Etheostoma fonticola	16	1
3144	Landa Lake	Cab-2	2024-04-25	12	Etheostoma fonticola	25	1
3144	Landa Lake	Cab-2	2024-04-25	12	Etheostoma fonticola	22	1
3144	Landa Lake	Cab-2	2024-04-25	12	Etheostoma fonticola	26	1
3144	Landa Lake	Cab-2	2024-04-25	12	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	12	Etheostoma fonticola	22	1
3144	Landa Lake	Cab-2	2024-04-25	12	Procambarus sp.		2
3144	Landa Lake	Cab-2	2024-04-25	13	Lepomis miniatus	25	1
3144	Landa Lake	Cab-2	2024-04-25	13	Lepomis miniatus	48	1
3144	Landa Lake	Cab-2	2024-04-25	13	Procambarus sp.		1
3144	Landa Lake	Cab-2	2024-04-25	13	Etheostoma fonticola	28	1
3144	Landa Lake	Cab-2	2024-04-25	13	Etheostoma fonticola	19	1
3144	Landa Lake	Cab-2	2024-04-25	13	Etheostoma fonticola	25	1
3144	Landa Lake	Cab-2	2024-04-25	13	Etheostoma fonticola	28	1
3144	Landa Lake	Cab-2	2024-04-25	13	Etheostoma fonticola	24	1
3144	Landa Lake	Cab-2	2024-04-25	13	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	13	Etheostoma fonticola	22	1
3144	Landa Lake	Cab-2	2024-04-25	13	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	13	Etheostoma fonticola	15	1
3144	Landa Lake	Cab-2	2024-04-25	13	Etheostoma fonticola	23	1
3144	Landa Lake	Cab-2	2024-04-25	14	Etheostoma fonticola	25	1

3144	Landa Lake	Cab-2	2024-04-25	14	Etheostoma fonticola	21	1
3144	Landa Lake	Cab-2	2024-04-25	15	Lepomis sp.	14	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	18	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	29	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	27	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	17	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	23	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	27	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	12	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	13	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	18	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	15	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	18	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	16	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	15	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	15	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	19	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	23	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	19	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	11	1
3145	Landa Lake	Lud-1	2024-04-25	1	Etheostoma fonticola	10	1
3145	Landa Lake	Lud-1	2024-04-25	1	Lepomis miniatus	98	1
3145	Landa Lake	Lud-1	2024-04-25	1	Lepomis miniatus	23	1
3145	Landa Lake	Lud-1	2024-04-25	1	Lepomis miniatus	27	1
3145	Landa Lake	Lud-1	2024-04-25	1	Lepomis miniatus	28	1
3145	Landa Lake	Lud-1	2024-04-25	1	Procambarus sp.		1
3145	Landa Lake	Lud-1	2024-04-25	1	Palaemonetes sp.		8
3145	Landa Lake	Lud-1	2024-04-25	1	Gambusia sp.	11	1
3145	Landa Lake	Lud-1	2024-04-25	1	Gambusia sp.	12	1

3145	Landa Lake	Lud-1	2024-04-25	2	Procambarus sp.		6
3145	Landa Lake	Lud-1	2024-04-25	2	Dionda nigrotaeniata	35	1
3145	Landa Lake	Lud-1	2024-04-25	2	Micropterus salmoides	45	1
3145	Landa Lake	Lud-1	2024-04-25	2	Micropterus salmoides	35	1
3145	Landa Lake	Lud-1	2024-04-25	2	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	2	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	2	Etheostoma fonticola	14	1
3145	Landa Lake	Lud-1	2024-04-25	2	Etheostoma fonticola	16	1
3145	Landa Lake	Lud-1	2024-04-25	2	Etheostoma fonticola	14	1
3145	Landa Lake	Lud-1	2024-04-25	2	Etheostoma fonticola	17	1
3145	Landa Lake	Lud-1	2024-04-25	2	Etheostoma fonticola	17	1
3145	Landa Lake	Lud-1	2024-04-25	2	Etheostoma fonticola	16	1
3145	Landa Lake	Lud-1	2024-04-25	2	Etheostoma fonticola	17	1
3145	Landa Lake	Lud-1	2024-04-25	2	Etheostoma fonticola	16	1
3145	Landa Lake	Lud-1	2024-04-25	2	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	2	Etheostoma fonticola	10	1
3145	Landa Lake	Lud-1	2024-04-25	2	Palaemonetes sp.		1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	17	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	18	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	15	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	21	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	27	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	14	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	11	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	17	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	13	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	24	1

3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	24	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	18	1
3145	Landa Lake	Lud-1	2024-04-25	3	Etheostoma fonticola	15	1
3145	Landa Lake	Lud-1	2024-04-25	3	Procambarus sp.		3
3145	Landa Lake	Lud-1	2024-04-25	3	Lepomis miniatus	86	1
3145	Landa Lake	Lud-1	2024-04-25	3	Palaemonetes sp.		2
3145	Landa Lake	Lud-1	2024-04-25	4	Dionda nigrotaeniata	31	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	21	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	35	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	15	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	21	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	16	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	32	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	28	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	14	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	23	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	24	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	14	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	15	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	18	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	19	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	18	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	19	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	23	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	30	1

3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	24	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	14	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	17	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	23	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	16	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	15	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	28	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	21	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	19	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	18	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	21	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	19	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	17	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	19	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	11	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	15	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	21	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	25	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	14	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	23	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	18	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	25	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	18	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	20	1

3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	18	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	16	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	4	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	4	Procambarus sp.		4
3145	Landa Lake	Lud-1	2024-04-25	4	Lepomis miniatus	67	1
3145	Landa Lake	Lud-1	2024-04-25	4	Palaemonetes sp.		4
3145	Landa Lake	Lud-1	2024-04-25	5	Procambarus sp.		2
3145	Landa Lake	Lud-1	2024-04-25	5	Palaemonetes sp.		5
3145	Landa Lake	Lud-1	2024-04-25	5	Etheostoma fonticola	21	1
3145	Landa Lake	Lud-1	2024-04-25	5	Etheostoma fonticola	14	1
3145	Landa Lake	Lud-1	2024-04-25	5	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	5	Etheostoma fonticola	16	1
3145	Landa Lake	Lud-1	2024-04-25	5	Etheostoma fonticola	15	1
3145	Landa Lake	Lud-1	2024-04-25	5	Etheostoma fonticola	19	1
3145	Landa Lake	Lud-1	2024-04-25	5	Etheostoma fonticola	25	1
3145	Landa Lake	Lud-1	2024-04-25	5	Etheostoma fonticola	17	1
3145	Landa Lake	Lud-1	2024-04-25	5	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	6	Procambarus sp.		3
3145	Landa Lake	Lud-1	2024-04-25	6	Etheostoma fonticola	24	1
3145	Landa Lake	Lud-1	2024-04-25	6	Etheostoma fonticola	24	1
3145	Landa Lake	Lud-1	2024-04-25	6	Etheostoma fonticola	33	1
3145	Landa Lake	Lud-1	2024-04-25	6	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	6	Etheostoma fonticola	14	1
3145	Landa Lake	Lud-1	2024-04-25	6	Etheostoma fonticola	15	1
3145	Landa Lake	Lud-1	2024-04-25	6	Etheostoma fonticola	16	1
3145	Landa Lake	Lud-1	2024-04-25	6	Etheostoma fonticola	10	1
3145	Landa Lake	Lud-1	2024-04-25	7	Procambarus sp.		2
3145	Landa Lake	Lud-1	2024-04-25	7	Etheostoma fonticola	30	1

3145	Landa Lake	Lud-1	2024-04-25	7	Etheostoma fonticola	24	1
3145	Landa Lake	Lud-1	2024-04-25	7	Etheostoma fonticola	10	1
3145	Landa Lake	Lud-1	2024-04-25	7	Etheostoma fonticola	16	1
3145	Landa Lake	Lud-1	2024-04-25	8	Etheostoma fonticola	18	1
3145	Landa Lake	Lud-1	2024-04-25	8	Etheostoma fonticola	17	1
3145	Landa Lake	Lud-1	2024-04-25	8	Etheostoma fonticola	10	1
3145	Landa Lake	Lud-1	2024-04-25	8	Etheostoma fonticola	21	1
3145	Landa Lake	Lud-1	2024-04-25	9	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	10	Etheostoma fonticola	19	1
3145	Landa Lake	Lud-1	2024-04-25	10	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	19	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	19	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	25	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	15	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	30	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	18	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	16	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	21	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	28	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	17	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	21	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	21	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	23	1
3145	Landa Lake	Lud-1	2024-04-25	11	Etheostoma fonticola	19	1
3145	Landa Lake	Lud-1	2024-04-25	12	Etheostoma fonticola	25	1
3145	Landa Lake	Lud-1	2024-04-25	12	Etheostoma fonticola	24	1

3145	Landa Lake	Lud-1	2024-04-25	12	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	12	Etheostoma fonticola	19	1
3145	Landa Lake	Lud-1	2024-04-25	12	Etheostoma fonticola	20	1
3145	Landa Lake	Lud-1	2024-04-25	12	Palaemonetes sp.		1
3145	Landa Lake	Lud-1	2024-04-25	13	Etheostoma fonticola	18	1
3145	Landa Lake	Lud-1	2024-04-25	13	Etheostoma fonticola	25	1
3145	Landa Lake	Lud-1	2024-04-25	13	Etheostoma fonticola	14	1
3145	Landa Lake	Lud-1	2024-04-25	13	Etheostoma fonticola	11	1
3145	Landa Lake	Lud-1	2024-04-25	13	Etheostoma fonticola	9	1
3145	Landa Lake	Lud-1	2024-04-25	13	Procambarus sp.		1
3145	Landa Lake	Lud-1	2024-04-25	14	Etheostoma fonticola	21	1
3145	Landa Lake	Lud-1	2024-04-25	14	Etheostoma fonticola	24	1
3145	Landa Lake	Lud-1	2024-04-25	14	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	14	Etheostoma fonticola	16	1
3145	Landa Lake	Lud-1	2024-04-25	14	Etheostoma fonticola	22	1
3145	Landa Lake	Lud-1	2024-04-25	14	Etheostoma fonticola	29	1
3145	Landa Lake	Lud-1	2024-04-25	14	Palaemonetes sp.		2
3145	Landa Lake	Lud-1	2024-04-25	15	Etheostoma fonticola	11	1
3145	Landa Lake	Lud-1	2024-04-25	15	Palaemonetes sp.		1
3145	Landa Lake	Lud-1	2024-04-25	16	Etheostoma fonticola	28	1
3145	Landa Lake	Lud-1	2024-04-25	17	Palaemonetes sp.		1
3145	Landa Lake	Lud-1	2024-04-25	17	Etheostoma fonticola	13	1
3145	Landa Lake	Lud-1	2024-04-25	18	Etheostoma fonticola	21	1
3145	Landa Lake	Lud-1	2024-04-25	18	Etheostoma fonticola	16	1
3145	Landa Lake	Lud-1	2024-04-25	19	Etheostoma fonticola	16	1
3145	Landa Lake	Lud-1	2024-04-25	20	No fish collected		
3146	Landa Lake	Lud-2	2024-04-25	1	Etheostoma fonticola	31	1
3146	Landa Lake	Lud-2	2024-04-25	1	Etheostoma fonticola	13	1
3146	Landa Lake	Lud-2	2024-04-25	1	Etheostoma fonticola	16	1
3146	Landa Lake	Lud-2	2024-04-25	1	Etheostoma fonticola	17	1

3146	Landa Lake	Lud-2	2024-04-25	1	Etheostoma fonticola	23	1
3146	Landa Lake	Lud-2	2024-04-25	1	Etheostoma fonticola	15	1
3146	Landa Lake	Lud-2	2024-04-25	1	Etheostoma fonticola	18	1
3146	Landa Lake	Lud-2	2024-04-25	1	Etheostoma fonticola	13	1
3146	Landa Lake	Lud-2	2024-04-25	1	Etheostoma fonticola	19	1
3146	Landa Lake	Lud-2	2024-04-25	1	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	1	Etheostoma fonticola	13	1
3146	Landa Lake	Lud-2	2024-04-25	1	Etheostoma fonticola	16	1
3146	Landa Lake	Lud-2	2024-04-25	1	Etheostoma fonticola	17	1
3146	Landa Lake	Lud-2	2024-04-25	1	Etheostoma fonticola	16	1
3146	Landa Lake	Lud-2	2024-04-25	1	Procambarus sp.		3
3146	Landa Lake	Lud-2	2024-04-25	1	Palaemonetes sp.		12
3146	Landa Lake	Lud-2	2024-04-25	1	Lepomis miniatus	32	1
3146	Landa Lake	Lud-2	2024-04-25	2	Procambarus sp.		2
3146	Landa Lake	Lud-2	2024-04-25	2	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	2	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	2	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	2	Etheostoma fonticola	19	1
3146	Landa Lake	Lud-2	2024-04-25	2	Etheostoma fonticola	18	1
3146	Landa Lake	Lud-2	2024-04-25	2	Etheostoma fonticola	23	1
3146	Landa Lake	Lud-2	2024-04-25	2	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	2	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	2	Etheostoma fonticola	25	1
3146	Landa Lake	Lud-2	2024-04-25	2	Etheostoma fonticola	16	1
3146	Landa Lake	Lud-2	2024-04-25	2	Etheostoma fonticola	15	1
3146	Landa Lake	Lud-2	2024-04-25	2	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	2	Lepomis miniatus	37	1
3146	Landa Lake	Lud-2	2024-04-25	2	Lepomis miniatus	35	1
3146	Landa Lake	Lud-2	2024-04-25	2	Lepomis miniatus	21	1
3146	Landa Lake	Lud-2	2024-04-25	2	Palaemonetes sp.		10

3146	Landa Lake	Lud-2	2024-04-25	2	Lepomis sp.	17	1
3146	Landa Lake	Lud-2	2024-04-25	2	Gambusia sp.	22	1
3146	Landa Lake	Lud-2	2024-04-25	3	Procambarus sp.		5
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	28	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	23	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	13	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	25	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	28	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	25	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	25	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	29	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	21	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	21	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	21	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	19	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	10	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	23	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	14	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	18	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	23	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	19	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	3	Etheostoma fonticola	16	1
3146	Landa Lake	Lud-2	2024-04-25	3	Lepomis miniatus	26	1
3146	Landa Lake	Lud-2	2024-04-25	3	Palaemonetes sp.		8

3146	Landa Lake	Lud-2	2024-04-25	4	Palaemonetes sp.		10
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	16	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	12	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	23	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	15	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	28	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	26	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	30	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	21	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	12	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	15	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	23	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	23	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	19	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	15	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	21	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	19	1
3146	Landa Lake	Lud-2	2024-04-25	4	Etheostoma fonticola	23	1
3146	Landa Lake	Lud-2	2024-04-25	4	Lepomis miniatus	30	1
3146	Landa Lake	Lud-2	2024-04-25	4	Lepomis miniatus	35	1
3146	Landa Lake	Lud-2	2024-04-25	4	Gambusia sp.	18	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	26	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	26	1

3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	25	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	17	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	15	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	18	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	19	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	19	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	18	1
3146	Landa Lake	Lud-2	2024-04-25	5	Etheostoma fonticola	11	1
3146	Landa Lake	Lud-2	2024-04-25	5	Procambarus sp.		1
3146	Landa Lake	Lud-2	2024-04-25	5	Lepomis miniatus	30	1
3146	Landa Lake	Lud-2	2024-04-25	5	Lepomis miniatus	22	1
3146	Landa Lake	Lud-2	2024-04-25	5	Lepomis miniatus	22	1
3146	Landa Lake	Lud-2	2024-04-25	5	Palaemonetes sp.		4
3146	Landa Lake	Lud-2	2024-04-25	6	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	6	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	6	Etheostoma fonticola	23	1
3146	Landa Lake	Lud-2	2024-04-25	6	Etheostoma fonticola	17	1
3146	Landa Lake	Lud-2	2024-04-25	6	Palaemonetes sp.		3
3146	Landa Lake	Lud-2	2024-04-25	7	Lepomis miniatus	26	1
3146	Landa Lake	Lud-2	2024-04-25	7	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	7	Etheostoma fonticola	25	1
3146	Landa Lake	Lud-2	2024-04-25	7	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	7	Etheostoma fonticola	29	1
3146	Landa Lake	Lud-2	2024-04-25	7	Etheostoma fonticola	20	1

3146	Landa Lake	Lud-2	2024-04-25	7	Etheostoma fonticola	23	1
3146	Landa Lake	Lud-2	2024-04-25	7	Etheostoma fonticola	16	1
3146	Landa Lake	Lud-2	2024-04-25	7	Palaemonetes sp.		2
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	30	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	28	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	28	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	25	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	23	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	19	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	19	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	25	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	15	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	25	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	25	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	29	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	18	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	29	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	21	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	23	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	23	1
3146	Landa Lake	Lud-2	2024-04-25	8	Etheostoma fonticola	10	1
3146	Landa Lake	Lud-2	2024-04-25	8	Palaemonetes sp.		3
3146	Landa Lake	Lud-2	2024-04-25	8	Procambarus sp.		1
3146	Landa Lake	Lud-2	2024-04-25	9	Palaemonetes sp.		1

3146	Landa Lake	Lud-2	2024-04-25	9	Etheostoma fonticola	28	1
3146	Landa Lake	Lud-2	2024-04-25	9	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	9	Etheostoma fonticola	18	1
3146	Landa Lake	Lud-2	2024-04-25	9	Etheostoma fonticola	14	1
3146	Landa Lake	Lud-2	2024-04-25	9	Etheostoma fonticola	17	1
3146	Landa Lake	Lud-2	2024-04-25	9	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	9	Gambusia sp.	13	1
3146	Landa Lake	Lud-2	2024-04-25	10	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	10	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	10	Etheostoma fonticola	19	1
3146	Landa Lake	Lud-2	2024-04-25	10	Etheostoma fonticola	21	1
3146	Landa Lake	Lud-2	2024-04-25	10	Etheostoma fonticola	16	1
3146	Landa Lake	Lud-2	2024-04-25	10	Etheostoma fonticola	12	1
3146	Landa Lake	Lud-2	2024-04-25	10	Procambarus sp.		1
3146	Landa Lake	Lud-2	2024-04-25	10	Lepomis miniatus	25	1
3146	Landa Lake	Lud-2	2024-04-25	11	Procambarus sp.		1
3146	Landa Lake	Lud-2	2024-04-25	11	Etheostoma fonticola	25	1
3146	Landa Lake	Lud-2	2024-04-25	11	Etheostoma fonticola	19	1
3146	Landa Lake	Lud-2	2024-04-25	11	Etheostoma fonticola	25	1
3146	Landa Lake	Lud-2	2024-04-25	11	Etheostoma fonticola	14	1
3146	Landa Lake	Lud-2	2024-04-25	11	Etheostoma fonticola	18	1
3146	Landa Lake	Lud-2	2024-04-25	11	Etheostoma fonticola	15	1
3146	Landa Lake	Lud-2	2024-04-25	11	Etheostoma fonticola	15	1
3146	Landa Lake	Lud-2	2024-04-25	11	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	11	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	11	Etheostoma fonticola	15	1
3146	Landa Lake	Lud-2	2024-04-25	11	Palaemonetes sp.		5
3146	Landa Lake	Lud-2	2024-04-25	11	Lepomis miniatus	25	1
3146	Landa Lake	Lud-2	2024-04-25	12	Procambarus sp.		1
3146	Landa Lake	Lud-2	2024-04-25	12	Etheostoma fonticola	20	1

3146	Landa Lake	Lud-2	2024-04-25	12	Etheostoma fonticola	16	1
3146	Landa Lake	Lud-2	2024-04-25	12	Etheostoma fonticola	21	1
3146	Landa Lake	Lud-2	2024-04-25	12	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	12	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	12	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	12	Etheostoma fonticola	25	1
3146	Landa Lake	Lud-2	2024-04-25	12	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	12	Etheostoma fonticola	16	1
3146	Landa Lake	Lud-2	2024-04-25	12	Etheostoma fonticola	21	1
3146	Landa Lake	Lud-2	2024-04-25	12	Etheostoma fonticola	26	1
3146	Landa Lake	Lud-2	2024-04-25	12	Etheostoma fonticola	15	1
3146	Landa Lake	Lud-2	2024-04-25	12	Etheostoma fonticola	21	1
3146	Landa Lake	Lud-2	2024-04-25	12	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	13	Procambarus sp.		2
3146	Landa Lake	Lud-2	2024-04-25	13	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	13	Etheostoma fonticola	18	1
3146	Landa Lake	Lud-2	2024-04-25	13	Etheostoma fonticola	17	1
3146	Landa Lake	Lud-2	2024-04-25	13	Etheostoma fonticola	11	1
3146	Landa Lake	Lud-2	2024-04-25	13	Lepomis miniatus	25	1
3146	Landa Lake	Lud-2	2024-04-25	13	Lepomis miniatus	70	1
3146	Landa Lake	Lud-2	2024-04-25	13	Lepomis miniatus	37	1
3146	Landa Lake	Lud-2	2024-04-25	13	Palaemonetes sp.		1
3146	Landa Lake	Lud-2	2024-04-25	14	Etheostoma fonticola	29	1
3146	Landa Lake	Lud-2	2024-04-25	14	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	14	Etheostoma fonticola	28	1
3146	Landa Lake	Lud-2	2024-04-25	14	Etheostoma fonticola	24	1
3146	Landa Lake	Lud-2	2024-04-25	14	Etheostoma fonticola	22	1
3146	Landa Lake	Lud-2	2024-04-25	14	Etheostoma fonticola	19	1
3146	Landa Lake	Lud-2	2024-04-25	14	Etheostoma fonticola	27	1
3146	Landa Lake	Lud-2	2024-04-25	14	Etheostoma fonticola	19	1

3146	Landa Lake	Lud-2	2024-04-25	14	Etheostoma fonticola	12	1
3146	Landa Lake	Lud-2	2024-04-25	14	Etheostoma fonticola	16	1
3146	Landa Lake	Lud-2	2024-04-25	14	Procambarus sp.		1
3146	Landa Lake	Lud-2	2024-04-25	15	Etheostoma fonticola	31	1
3146	Landa Lake	Lud-2	2024-04-25	15	Etheostoma fonticola	18	1
3146	Landa Lake	Lud-2	2024-04-25	15	Etheostoma fonticola	25	1
3146	Landa Lake	Lud-2	2024-04-25	15	Etheostoma fonticola	21	1
3146	Landa Lake	Lud-2	2024-04-25	15	Etheostoma fonticola	28	1
3146	Landa Lake	Lud-2	2024-04-25	15	Etheostoma fonticola	21	1
3146	Landa Lake	Lud-2	2024-04-25	15	Etheostoma fonticola	20	1
3146	Landa Lake	Lud-2	2024-04-25	15	Palaemonetes sp.		1
3146	Landa Lake	Lud-2	2024-04-25	16	Procambarus sp.		4
3147	Landa Lake	Bryo-1	2024-04-30	1	Palaemonetes sp.		3
3147	Landa Lake	Bryo-1	2024-04-30	1	Etheostoma fonticola	22	1
3147	Landa Lake	Bryo-1	2024-04-30	1	Dionda nigrotaeniata	17	1
3147	Landa Lake	Bryo-1	2024-04-30	1	Dionda nigrotaeniata	12	1
3147	Landa Lake	Bryo-1	2024-04-30	2	Palaemonetes sp.		5
3147	Landa Lake	Bryo-1	2024-04-30	2	Etheostoma fonticola	31	1
3147	Landa Lake	Bryo-1	2024-04-30	2	Etheostoma fonticola	33	1
3147	Landa Lake	Bryo-1	2024-04-30	2	Etheostoma fonticola	31	1
3147	Landa Lake	Bryo-1	2024-04-30	2	Etheostoma fonticola	32	1
3147	Landa Lake	Bryo-1	2024-04-30	2	Etheostoma fonticola	27	1
3147	Landa Lake	Bryo-1	2024-04-30	2	Etheostoma fonticola	24	1
3147	Landa Lake	Bryo-1	2024-04-30	2	Etheostoma fonticola	21	1
3147	Landa Lake	Bryo-1	2024-04-30	3	Etheostoma fonticola	31	1
3147	Landa Lake	Bryo-1	2024-04-30	3	Palaemonetes sp.		1
3147	Landa Lake	Bryo-1	2024-04-30	4	Etheostoma fonticola	23	1
3147	Landa Lake	Bryo-1	2024-04-30	4	Etheostoma fonticola	30	1
3147	Landa Lake	Bryo-1	2024-04-30	4	Etheostoma fonticola	31	1
3147	Landa Lake	Bryo-1	2024-04-30	4	Etheostoma fonticola	30	1

3147	Landa Lake	Bryo-1	2024-04-30	4	Palaemonetes sp.		2
3147	Landa Lake	Bryo-1	2024-04-30	5	Etheostoma fonticola	28	1
3147	Landa Lake	Bryo-1	2024-04-30	5	Etheostoma fonticola	30	1
3147	Landa Lake	Bryo-1	2024-04-30	5	Etheostoma fonticola	32	1
3147	Landa Lake	Bryo-1	2024-04-30	6	Etheostoma fonticola	32	1
3147	Landa Lake	Bryo-1	2024-04-30	7	No fish collected		
3147	Landa Lake	Bryo-1	2024-04-30	8	Etheostoma fonticola	25	1
3147	Landa Lake	Bryo-1	2024-04-30	8	Etheostoma fonticola	39	1
3147	Landa Lake	Bryo-1	2024-04-30	9	No fish collected		
3147	Landa Lake	Bryo-1	2024-04-30	10	Etheostoma fonticola	31	1
3147	Landa Lake	Bryo-1	2024-04-30	11	No fish collected		
3147	Landa Lake	Bryo-1	2024-04-30	12	Etheostoma fonticola	35	1
3147	Landa Lake	Bryo-1	2024-04-30	13	Procambarus sp.		1
3147	Landa Lake	Bryo-1	2024-04-30	14	No fish collected		
3147	Landa Lake	Bryo-1	2024-04-30	15	Palaemonetes sp.		1
3148	Landa Lake	Bryo-2	2024-04-30	1	Gambusia sp.	10	1
3148	Landa Lake	Bryo-2	2024-04-30	1	Gambusia sp.	12	1
3148	Landa Lake	Bryo-2	2024-04-30	1	Procambarus sp.		2
3148	Landa Lake	Bryo-2	2024-04-30	1	Etheostoma fonticola	16	1
3148	Landa Lake	Bryo-2	2024-04-30	1	Dionda nigrotaeniata	15	1
3148	Landa Lake	Bryo-2	2024-04-30	1	Palaemonetes sp.		1
3148	Landa Lake	Bryo-2	2024-04-30	2	Etheostoma fonticola	30	1
3148	Landa Lake	Bryo-2	2024-04-30	2	Etheostoma fonticola	15	1
3148	Landa Lake	Bryo-2	2024-04-30	2	Etheostoma fonticola	30	1
3148	Landa Lake	Bryo-2	2024-04-30	2	Etheostoma fonticola	16	1
3148	Landa Lake	Bryo-2	2024-04-30	2	Palaemonetes sp.		1
3148	Landa Lake	Bryo-2	2024-04-30	3	Etheostoma fonticola	26	1
3148	Landa Lake	Bryo-2	2024-04-30	3	Etheostoma fonticola	31	1
3148	Landa Lake	Bryo-2	2024-04-30	3	Etheostoma fonticola	20	1
3148	Landa Lake	Bryo-2	2024-04-30	3	Etheostoma fonticola	22	1

3148	Landa Lake	Bryo-2	2024-04-30	3	Etheostoma fonticola	22	1
3148	Landa Lake	Bryo-2	2024-04-30	3	Etheostoma fonticola	32	1
3148	Landa Lake	Bryo-2	2024-04-30	3	Etheostoma fonticola	21	1
3148	Landa Lake	Bryo-2	2024-04-30	3	Etheostoma fonticola	33	1
3148	Landa Lake	Bryo-2	2024-04-30	3	Etheostoma fonticola	19	1
3148	Landa Lake	Bryo-2	2024-04-30	3	Etheostoma fonticola	16	1
3148	Landa Lake	Bryo-2	2024-04-30	3	Palaemonetes sp.		1
3148	Landa Lake	Bryo-2	2024-04-30	3	Procambarus sp.		1
3148	Landa Lake	Bryo-2	2024-04-30	4	Etheostoma fonticola	31	1
3148	Landa Lake	Bryo-2	2024-04-30	4	Etheostoma fonticola	28	1
3148	Landa Lake	Bryo-2	2024-04-30	4	Etheostoma fonticola	28	1
3148	Landa Lake	Bryo-2	2024-04-30	4	Etheostoma fonticola	32	1
3148	Landa Lake	Bryo-2	2024-04-30	4	Etheostoma fonticola	23	1
3148	Landa Lake	Bryo-2	2024-04-30	4	Etheostoma fonticola	19	1
3148	Landa Lake	Bryo-2	2024-04-30	4	Etheostoma fonticola	20	1
3148	Landa Lake	Bryo-2	2024-04-30	5	Etheostoma fonticola	20	1
3148	Landa Lake	Bryo-2	2024-04-30	5	Etheostoma fonticola	26	1
3148	Landa Lake	Bryo-2	2024-04-30	5	Etheostoma fonticola	12	1
3148	Landa Lake	Bryo-2	2024-04-30	5	Etheostoma fonticola	11	1
3148	Landa Lake	Bryo-2	2024-04-30	5	Etheostoma fonticola	11	1
3148	Landa Lake	Bryo-2	2024-04-30	6	Etheostoma fonticola	31	1
3148	Landa Lake	Bryo-2	2024-04-30	6	Etheostoma fonticola	23	1
3148	Landa Lake	Bryo-2	2024-04-30	6	Etheostoma fonticola	14	1
3148	Landa Lake	Bryo-2	2024-04-30	6	Palaemonetes sp.		1
3148	Landa Lake	Bryo-2	2024-04-30	7	Etheostoma fonticola	30	1
3148	Landa Lake	Bryo-2	2024-04-30	7	Etheostoma fonticola	21	1
3148	Landa Lake	Bryo-2	2024-04-30	7	Etheostoma fonticola	9	1
3148	Landa Lake	Bryo-2	2024-04-30	8	Palaemonetes sp.		1
3148	Landa Lake	Bryo-2	2024-04-30	9	Etheostoma fonticola	31	1
3148	Landa Lake	Bryo-2	2024-04-30	9	Etheostoma fonticola	15	1

3148	Landa Lake	Bryo-2	2024-04-30	10	Etheostoma fonticola	20	1
3148	Landa Lake	Bryo-2	2024-04-30	10	Procambarus sp.		1
3148	Landa Lake	Bryo-2	2024-04-30	11	Etheostoma fonticola	14	1
3148	Landa Lake	Bryo-2	2024-04-30	11	Etheostoma fonticola	17	1
3148	Landa Lake	Bryo-2	2024-04-30	11	Etheostoma fonticola	32	1
3148	Landa Lake	Bryo-2	2024-04-30	11	Etheostoma fonticola	34	1
3148	Landa Lake	Bryo-2	2024-04-30	11	Etheostoma fonticola	20	1
3148	Landa Lake	Bryo-2	2024-04-30	12	Procambarus sp.		1
3148	Landa Lake	Bryo-2	2024-04-30	12	Etheostoma fonticola	21	1
3148	Landa Lake	Bryo-2	2024-04-30	13	Etheostoma fonticola	11	1
3148	Landa Lake	Bryo-2	2024-04-30	14	Etheostoma fonticola	28	1
3148	Landa Lake	Bryo-2	2024-04-30	14	Etheostoma fonticola	34	1
3148	Landa Lake	Bryo-2	2024-04-30	14	Etheostoma fonticola	31	1
3148	Landa Lake	Bryo-2	2024-04-30	14	Etheostoma fonticola	25	1
3148	Landa Lake	Bryo-2	2024-04-30	14	Etheostoma fonticola	12	1
3148	Landa Lake	Bryo-2	2024-04-30	15	No fish collected		
3149	Landa Lake	Val-1	2024-04-30	1	Astyanax mexicanus	32	1
3149	Landa Lake	Val-1	2024-04-30	1	Astyanax mexicanus	28	1
3149	Landa Lake	Val-1	2024-04-30	1	Astyanax mexicanus	27	1
3149	Landa Lake	Val-1	2024-04-30	1	Astyanax mexicanus	25	1
3149	Landa Lake	Val-1	2024-04-30	1	Procambarus sp.		2
3149	Landa Lake	Val-1	2024-04-30	1	Lepomis miniatus	25	1
3149	Landa Lake	Val-1	2024-04-30	1	Lepomis miniatus	20	1
3149	Landa Lake	Val-1	2024-04-30	1	Palaemonetes sp.		13
3149	Landa Lake	Val-1	2024-04-30	1	Dionda nigrotaeniata	19	1
3149	Landa Lake	Val-1	2024-04-30	1	Etheostoma fonticola	12	1
3149	Landa Lake	Val-1	2024-04-30	2	Astyanax mexicanus	27	1
3149	Landa Lake	Val-1	2024-04-30	2	Astyanax mexicanus	30	1
3149	Landa Lake	Val-1	2024-04-30	2	Astyanax mexicanus	31	1
3149	Landa Lake	Val-1	2024-04-30	2	Astyanax mexicanus	32	1

3149	Landa Lake	Val-1	2024-04-30	2	Astyanax mexicanus	35	1
3149	Landa Lake	Val-1	2024-04-30	2	Astyanax mexicanus	31	1
3149	Landa Lake	Val-1	2024-04-30	2	Astyanax mexicanus	25	1
3149	Landa Lake	Val-1	2024-04-30	2	Lepomis miniatus	25	1
3149	Landa Lake	Val-1	2024-04-30	2	Palaemonetes sp.		18
3149	Landa Lake	Val-1	2024-04-30	3	Palaemonetes sp.		8
3149	Landa Lake	Val-1	2024-04-30	3	Etheostoma fonticola	21	1
3149	Landa Lake	Val-1	2024-04-30	3	Etheostoma fonticola	17	1
3149	Landa Lake	Val-1	2024-04-30	3	Etheostoma fonticola	12	1
3149	Landa Lake	Val-1	2024-04-30	3	Etheostoma fonticola	14	1
3149	Landa Lake	Val-1	2024-04-30	4	Astyanax mexicanus	30	1
3149	Landa Lake	Val-1	2024-04-30	4	Etheostoma fonticola	18	1
3149	Landa Lake	Val-1	2024-04-30	4	Etheostoma fonticola	23	1
3149	Landa Lake	Val-1	2024-04-30	4	Lepomis miniatus	25	1
3149	Landa Lake	Val-1	2024-04-30	4	Palaemonetes sp.		2
3149	Landa Lake	Val-1	2024-04-30	5	Palaemonetes sp.		14
3149	Landa Lake	Val-1	2024-04-30	5	Procambarus sp.		1
3149	Landa Lake	Val-1	2024-04-30	5	Lepomis miniatus	25	1
3149	Landa Lake	Val-1	2024-04-30	5	Etheostoma fonticola	16	1
3149	Landa Lake	Val-1	2024-04-30	6	Astyanax mexicanus	29	1
3149	Landa Lake	Val-1	2024-04-30	6	Astyanax mexicanus	38	1
3149	Landa Lake	Val-1	2024-04-30	6	Astyanax mexicanus	32	1
3149	Landa Lake	Val-1	2024-04-30	6	Astyanax mexicanus	25	1
3149	Landa Lake	Val-1	2024-04-30	6	Astyanax mexicanus	26	1
3149	Landa Lake	Val-1	2024-04-30	6	Etheostoma fonticola	29	1
3149	Landa Lake	Val-1	2024-04-30	6	Etheostoma fonticola	22	1
3149	Landa Lake	Val-1	2024-04-30	6	Etheostoma fonticola	25	1
3149	Landa Lake	Val-1	2024-04-30	6	Lepomis miniatus	30	1
3149	Landa Lake	Val-1	2024-04-30	6	Palaemonetes sp.		7
3149	Landa Lake	Val-1	2024-04-30	7	Lepomis miniatus	32	1

3149	Landa Lake	Val-1	2024-04-30	7	Etheostoma fonticola	23	1
3149	Landa Lake	Val-1	2024-04-30	7	Etheostoma fonticola	29	1
3149	Landa Lake	Val-1	2024-04-30	7	Etheostoma fonticola	26	1
3149	Landa Lake	Val-1	2024-04-30	7	Procambarus sp.		1
3149	Landa Lake	Val-1	2024-04-30	7	Astyanax mexicanus	22	1
3149	Landa Lake	Val-1	2024-04-30	7	Astyanax mexicanus	22	1
3149	Landa Lake	Val-1	2024-04-30	7	Palaemonetes sp.		3
3149	Landa Lake	Val-1	2024-04-30	8	Lepomis miniatus	30	1
3149	Landa Lake	Val-1	2024-04-30	8	Palaemonetes sp.		6
3149	Landa Lake	Val-1	2024-04-30	8	Procambarus sp.		1
3149	Landa Lake	Val-1	2024-04-30	8	Astyanax mexicanus	35	1
3149	Landa Lake	Val-1	2024-04-30	8	Etheostoma fonticola	21	1
3149	Landa Lake	Val-1	2024-04-30	8	Etheostoma fonticola	17	1
3149	Landa Lake	Val-1	2024-04-30	8	Etheostoma fonticola	19	1
3149	Landa Lake	Val-1	2024-04-30	8	Etheostoma fonticola	24	1
3149	Landa Lake	Val-1	2024-04-30	8	Lepomis sp.	17	1
3149	Landa Lake	Val-1	2024-04-30	9	Palaemonetes sp.		3
3149	Landa Lake	Val-1	2024-04-30	9	Etheostoma fonticola	20	1
3149	Landa Lake	Val-1	2024-04-30	9	Etheostoma fonticola	25	1
3149	Landa Lake	Val-1	2024-04-30	9	Etheostoma fonticola	14	1
3149	Landa Lake	Val-1	2024-04-30	9	Etheostoma fonticola	26	1
3149	Landa Lake	Val-1	2024-04-30	10	Procambarus sp.		3
3149	Landa Lake	Val-1	2024-04-30	10	Etheostoma fonticola	22	1
3149	Landa Lake	Val-1	2024-04-30	10	Etheostoma fonticola	15	1
3149	Landa Lake	Val-1	2024-04-30	10	Palaemonetes sp.		1
3149	Landa Lake	Val-1	2024-04-30	11	Procambarus sp.		1
3149	Landa Lake	Val-1	2024-04-30	11	Etheostoma fonticola	24	1
3149	Landa Lake	Val-1	2024-04-30	11	Etheostoma fonticola	20	1
3149	Landa Lake	Val-1	2024-04-30	11	Palaemonetes sp.		6
3149	Landa Lake	Val-1	2024-04-30	12	Etheostoma fonticola	18	1

3149	Landa Lake	Val-1	2024-04-30	12	Palaemonetes sp.		9
3149	Landa Lake	Val-1	2024-04-30	13	Procambarus sp.		1
3149	Landa Lake	Val-1	2024-04-30	13	Etheostoma fonticola	20	1
3149	Landa Lake	Val-1	2024-04-30	13	Etheostoma fonticola	23	1
3149	Landa Lake	Val-1	2024-04-30	13	Palaemonetes sp.		1
3149	Landa Lake	Val-1	2024-04-30	14	Procambarus sp.		1
3149	Landa Lake	Val-1	2024-04-30	14	Palaemonetes sp.		1
3149	Landa Lake	Val-1	2024-04-30	14	Etheostoma fonticola	24	1
3149	Landa Lake	Val-1	2024-04-30	15	Etheostoma fonticola	26	1
3149	Landa Lake	Val-1	2024-04-30	16	Lepomis sp.	15	1
3149	Landa Lake	Val-1	2024-04-30	16	Etheostoma fonticola	20	1
3149	Landa Lake	Val-1	2024-04-30	17	Palaemonetes sp.		2
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	24	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	15	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	19	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	30	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	26	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	11	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	20	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	16	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	14	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	18	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	26	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	16	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	26	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	24	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	22	1

3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	11	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	19	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	21	1
3150	Landa Lake	Val-2	2024-04-30	1	Etheostoma fonticola	14	1
3150	Landa Lake	Val-2	2024-04-30	1	Procambarus sp.		1
3150	Landa Lake	Val-2	2024-04-30	1	Dionda nigrotaeniata	34	1
3150	Landa Lake	Val-2	2024-04-30	1	Dionda nigrotaeniata	34	1
3150	Landa Lake	Val-2	2024-04-30	1	Lepomis miniatus	28	1
3150	Landa Lake	Val-2	2024-04-30	1	Lepomis miniatus	24	1
3150	Landa Lake	Val-2	2024-04-30	1	Lepomis miniatus	37	1
3150	Landa Lake	Val-2	2024-04-30	1	Palaemonetes sp.		1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	27	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	15	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	19	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	16	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	30	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	30	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	27	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	21	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	29	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	16	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	15	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	17	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	10	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	19	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	10	1

3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	29	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	28	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	24	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	27	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	15	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	17	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	19	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	16	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	26	1
3150	Landa Lake	Val-2	2024-04-30	2	Etheostoma fonticola	24	1
3150	Landa Lake	Val-2	2024-04-30	2	Procambarus sp.		3
3150	Landa Lake	Val-2	2024-04-30	2	Dionda nigrotaeniata	35	1
3150	Landa Lake	Val-2	2024-04-30	2	Dionda nigrotaeniata	19	1
3150	Landa Lake	Val-2	2024-04-30	2	Palaemonetes sp.		3
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	28	1
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	28	1
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	29	1
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	28	1
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	28	1
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	32	1
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	17	1
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	27	1
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	22	1
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	24	1
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	17	1
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	28	1
3150	Landa Lake	Val-2	2024-04-30	3	Etheostoma fonticola	14	1

3150	Landa Lake	Val-2	2024-04-30	3	Dionda nigrotaeniata	32	1
3150	Landa Lake	Val-2	2024-04-30	3	Procambarus sp.		2
3150	Landa Lake	Val-2	2024-04-30	3	Micropterus salmoides	50	1
3150	Landa Lake	Val-2	2024-04-30	3	Palaemonetes sp.		2
3150	Landa Lake	Val-2	2024-04-30	4	Dionda nigrotaeniata	36	1
3150	Landa Lake	Val-2	2024-04-30	4	Dionda nigrotaeniata	34	1
3150	Landa Lake	Val-2	2024-04-30	4	Dionda nigrotaeniata	40	1
3150	Landa Lake	Val-2	2024-04-30	4	Dionda nigrotaeniata	27	1
3150	Landa Lake	Val-2	2024-04-30	4	Dionda nigrotaeniata	34	1
3150	Landa Lake	Val-2	2024-04-30	4	Lepomis miniatus	26	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	20	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	19	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	13	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	26	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	19	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	21	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	17	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	24	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	22	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	16	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	22	1
3150	Landa Lake	Val-2	2024-04-30	4	Etheostoma fonticola	21	1
3150	Landa Lake	Val-2	2024-04-30	5	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	5	Etheostoma fonticola	32	1
3150	Landa Lake	Val-2	2024-04-30	5	Etheostoma fonticola	20	1
3150	Landa Lake	Val-2	2024-04-30	5	Etheostoma fonticola	16	1
3150	Landa Lake	Val-2	2024-04-30	5	Etheostoma fonticola	22	1

3150	Landa Lake	Val-2	2024-04-30	5	Etheostoma fonticola	21	1
3150	Landa Lake	Val-2	2024-04-30	5	Etheostoma fonticola	20	1
3150	Landa Lake	Val-2	2024-04-30	5	Etheostoma fonticola	16	1
3150	Landa Lake	Val-2	2024-04-30	5	Etheostoma fonticola	15	1
3150	Landa Lake	Val-2	2024-04-30	5	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	5	Etheostoma fonticola	15	1
3150	Landa Lake	Val-2	2024-04-30	5	Palaemonetes sp.		1
3150	Landa Lake	Val-2	2024-04-30	5	Astyanax mexicanus	30	1
3150	Landa Lake	Val-2	2024-04-30	6	Palaemonetes sp.		1
3150	Landa Lake	Val-2	2024-04-30	6	Etheostoma fonticola	22	1
3150	Landa Lake	Val-2	2024-04-30	6	Etheostoma fonticola	27	1
3150	Landa Lake	Val-2	2024-04-30	6	Etheostoma fonticola	22	1
3150	Landa Lake	Val-2	2024-04-30	6	Etheostoma fonticola	26	1
3150	Landa Lake	Val-2	2024-04-30	6	Etheostoma fonticola	21	1
3150	Landa Lake	Val-2	2024-04-30	6	Etheostoma fonticola	29	1
3150	Landa Lake	Val-2	2024-04-30	6	Etheostoma fonticola	27	1
3150	Landa Lake	Val-2	2024-04-30	6	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	6	Etheostoma fonticola	28	1
3150	Landa Lake	Val-2	2024-04-30	6	Etheostoma fonticola	16	1
3150	Landa Lake	Val-2	2024-04-30	6	Palaemonetes sp.		2
3150	Landa Lake	Val-2	2024-04-30	6	Lepomis miniatus	15	1
3150	Landa Lake	Val-2	2024-04-30	7	Etheostoma fonticola	26	1
3150	Landa Lake	Val-2	2024-04-30	7	Etheostoma fonticola	24	1
3150	Landa Lake	Val-2	2024-04-30	7	Etheostoma fonticola	22	1
3150	Landa Lake	Val-2	2024-04-30	7	Etheostoma fonticola	29	1
3150	Landa Lake	Val-2	2024-04-30	7	Etheostoma fonticola	26	1
3150	Landa Lake	Val-2	2024-04-30	7	Etheostoma fonticola	22	1
3150	Landa Lake	Val-2	2024-04-30	7	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	7	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	7	Etheostoma fonticola	19	1

3150	Landa Lake	Val-2	2024-04-30	7	Etheostoma fonticola	26	1
3150	Landa Lake	Val-2	2024-04-30	7	Etheostoma fonticola	10	1
3150	Landa Lake	Val-2	2024-04-30	7	Etheostoma fonticola	11	1
3150	Landa Lake	Val-2	2024-04-30	7	Etheostoma fonticola	13	1
3150	Landa Lake	Val-2	2024-04-30	7	Dionda nigrotaeniata	36	1
3150	Landa Lake	Val-2	2024-04-30	8	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	8	Etheostoma fonticola	31	1
3150	Landa Lake	Val-2	2024-04-30	8	Etheostoma fonticola	28	1
3150	Landa Lake	Val-2	2024-04-30	8	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	8	Etheostoma fonticola	14	1
3150	Landa Lake	Val-2	2024-04-30	8	Etheostoma fonticola	21	1
3150	Landa Lake	Val-2	2024-04-30	8	Lepomis miniatus	23	1
3150	Landa Lake	Val-2	2024-04-30	8	Lepomis miniatus	27	1
3150	Landa Lake	Val-2	2024-04-30	9	Etheostoma fonticola	17	1
3150	Landa Lake	Val-2	2024-04-30	9	Etheostoma fonticola	20	1
3150	Landa Lake	Val-2	2024-04-30	9	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	9	Etheostoma fonticola	26	1
3150	Landa Lake	Val-2	2024-04-30	9	Etheostoma fonticola	22	1
3150	Landa Lake	Val-2	2024-04-30	9	Etheostoma fonticola	16	1
3150	Landa Lake	Val-2	2024-04-30	9	Etheostoma fonticola	18	1
3150	Landa Lake	Val-2	2024-04-30	9	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	9	Lepomis miniatus	28	1
3150	Landa Lake	Val-2	2024-04-30	9	Palaemonetes sp.		1
3150	Landa Lake	Val-2	2024-04-30	10	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	10	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	10	Etheostoma fonticola	14	1
3150	Landa Lake	Val-2	2024-04-30	10	Etheostoma fonticola	14	1
3150	Landa Lake	Val-2	2024-04-30	10	Etheostoma fonticola	21	1
3150	Landa Lake	Val-2	2024-04-30	10	Etheostoma fonticola	14	1
3150	Landa Lake	Val-2	2024-04-30	10	Etheostoma fonticola	22	1

3150	Landa Lake	Val-2	2024-04-30	10	Etheostoma fonticola	18	1
3150	Landa Lake	Val-2	2024-04-30	10	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	10	Etheostoma fonticola	12	1
3150	Landa Lake	Val-2	2024-04-30	10	Palaemonetes sp.		1
3150	Landa Lake	Val-2	2024-04-30	11	Etheostoma fonticola	38	1
3150	Landa Lake	Val-2	2024-04-30	11	Etheostoma fonticola	28	1
3150	Landa Lake	Val-2	2024-04-30	11	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	11	Etheostoma fonticola	22	1
3150	Landa Lake	Val-2	2024-04-30	11	Etheostoma fonticola	18	1
3150	Landa Lake	Val-2	2024-04-30	11	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	12	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	12	Etheostoma fonticola	18	1
3150	Landa Lake	Val-2	2024-04-30	12	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	12	Etheostoma fonticola	28	1
3150	Landa Lake	Val-2	2024-04-30	12	Etheostoma fonticola	21	1
3150	Landa Lake	Val-2	2024-04-30	12	Astyanax mexicanus	47	1
3150	Landa Lake	Val-2	2024-04-30	12	Dionda nigrotaeniata	49	1
3150	Landa Lake	Val-2	2024-04-30	12	Procambarus sp.		2
3150	Landa Lake	Val-2	2024-04-30	12	Lepomis miniatus	28	1
3150	Landa Lake	Val-2	2024-04-30	13	Etheostoma fonticola	24	1
3150	Landa Lake	Val-2	2024-04-30	13	Etheostoma fonticola	30	1
3150	Landa Lake	Val-2	2024-04-30	13	Etheostoma fonticola	24	1
3150	Landa Lake	Val-2	2024-04-30	13	Etheostoma fonticola	26	1
3150	Landa Lake	Val-2	2024-04-30	13	Etheostoma fonticola	22	1
3150	Landa Lake	Val-2	2024-04-30	13	Dionda nigrotaeniata	35	1
3150	Landa Lake	Val-2	2024-04-30	14	Etheostoma fonticola	24	1
3150	Landa Lake	Val-2	2024-04-30	14	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	14	Etheostoma fonticola	22	1
3150	Landa Lake	Val-2	2024-04-30	14	Etheostoma fonticola	28	1
3150	Landa Lake	Val-2	2024-04-30	14	Etheostoma fonticola	19	1

3150	Landa Lake	Val-2	2024-04-30	14	Procambarus sp.		2
3150	Landa Lake	Val-2	2024-04-30	15	Etheostoma fonticola	24	1
3150	Landa Lake	Val-2	2024-04-30	15	Etheostoma fonticola	24	1
3150	Landa Lake	Val-2	2024-04-30	15	Etheostoma fonticola	13	1
3150	Landa Lake	Val-2	2024-04-30	15	Dionda nigrotaeniata	36	1
3150	Landa Lake	Val-2	2024-04-30	16	Lepomis miniatus	28	1
3150	Landa Lake	Val-2	2024-04-30	16	Etheostoma fonticola	15	1
3150	Landa Lake	Val-2	2024-04-30	16	Etheostoma fonticola	15	1
3150	Landa Lake	Val-2	2024-04-30	16	Etheostoma fonticola	26	1
3150	Landa Lake	Val-2	2024-04-30	16	Etheostoma fonticola	27	1
3150	Landa Lake	Val-2	2024-04-30	16	Etheostoma fonticola	30	1
3150	Landa Lake	Val-2	2024-04-30	16	Etheostoma fonticola	15	1
3150	Landa Lake	Val-2	2024-04-30	17	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	17	Etheostoma fonticola	16	1
3150	Landa Lake	Val-2	2024-04-30	17	Etheostoma fonticola	27	1
3150	Landa Lake	Val-2	2024-04-30	17	Palaemonetes sp.		1
3150	Landa Lake	Val-2	2024-04-30	18	Etheostoma fonticola	18	1
3150	Landa Lake	Val-2	2024-04-30	18	Etheostoma fonticola	18	1
3150	Landa Lake	Val-2	2024-04-30	19	Etheostoma fonticola	33	1
3150	Landa Lake	Val-2	2024-04-30	19	Dionda nigrotaeniata	35	1
3150	Landa Lake	Val-2	2024-04-30	20	Etheostoma fonticola	32	1
3150	Landa Lake	Val-2	2024-04-30	20	Etheostoma fonticola	17	1
3150	Landa Lake	Val-2	2024-04-30	20	Etheostoma fonticola	20	1
3150	Landa Lake	Val-2	2024-04-30	20	Etheostoma fonticola	20	1
3150	Landa Lake	Val-2	2024-04-30	21	Etheostoma fonticola	23	1
3150	Landa Lake	Val-2	2024-04-30	21	Etheostoma fonticola	22	1
3150	Landa Lake	Val-2	2024-04-30	22	Etheostoma fonticola	25	1
3150	Landa Lake	Val-2	2024-04-30	22	Etheostoma fonticola	16	1
3150	Landa Lake	Val-2	2024-04-30	23	Etheostoma fonticola	28	1
3150	Landa Lake	Val-2	2024-04-30	23	Etheostoma fonticola	23	1

3150	Landa Lake	Val-2	2024-04-30	24	No fish collected		
3151	Landa Lake	Open-1	2024-04-30	1	Etheostoma fonticola	30	1
3151	Landa Lake	Open-1	2024-04-30	2	No fish collected		
3151	Landa Lake	Open-1	2024-04-30	3	No fish collected		
3151	Landa Lake	Open-1	2024-04-30	4	No fish collected		
3151	Landa Lake	Open-1	2024-04-30	5	No fish collected		
3151	Landa Lake	Open-1	2024-04-30	6	No fish collected		
3151	Landa Lake	Open-1	2024-04-30	7	No fish collected		
3151	Landa Lake	Open-1	2024-04-30	8	No fish collected		
3151	Landa Lake	Open-1	2024-04-30	9	No fish collected		
3151	Landa Lake	Open-1	2024-04-30	10	No fish collected		
3151	Landa Lake	Open-1	2024-04-30	11	No fish collected		
3151	Landa Lake	Open-1	2024-04-30	12	No fish collected		
3151	Landa Lake	Open-1	2024-04-30	13	No fish collected		
3151	Landa Lake	Open-1	2024-04-30	14	No fish collected		
3151	Landa Lake	Open-1	2024-04-30	15	No fish collected		
3152	Landa Lake	Open-2	2024-04-30	1	No fish collected		
3152	Landa Lake	Open-2	2024-04-30	2	No fish collected		
3152	Landa Lake	Open-2	2024-04-30	3	No fish collected		
3152	Landa Lake	Open-2	2024-04-30	4	No fish collected		
3152	Landa Lake	Open-2	2024-04-30	5	No fish collected		
3152	Landa Lake	Open-2	2024-04-30	6	No fish collected		
3152	Landa Lake	Open-2	2024-04-30	7	Etheostoma fonticola	19	1
3152	Landa Lake	Open-2	2024-04-30	8	No fish collected		
3152	Landa Lake	Open-2	2024-04-30	9	No fish collected		
3152	Landa Lake	Open-2	2024-04-30	10	No fish collected		
3152	Landa Lake	Open-2	2024-04-30	11	No fish collected		
3152	Landa Lake	Open-2	2024-04-30	12	No fish collected		
3152	Landa Lake	Open-2	2024-04-30	13	No fish collected		
3152	Landa Lake	Open-2	2024-04-30	14	No fish collected		

3152	Landa Lake	Open-2	2024-04-30	15	No fish collected		
3153	Old Channel Reach	Bryo-1	2024-05-01	1	Etheostoma fonticola	20	1
3153	Old Channel Reach	Bryo-1	2024-05-01	1	Etheostoma fonticola	24	1
3153	Old Channel Reach	Bryo-1	2024-05-01	1	Palaemonetes sp.		1
3153	Old Channel Reach	Bryo-1	2024-05-01	2	Etheostoma fonticola	24	1
3153	Old Channel Reach	Bryo-1	2024-05-01	2	Etheostoma fonticola	20	1
3153	Old Channel Reach	Bryo-1	2024-05-01	2	Etheostoma fonticola	23	1
3153	Old Channel Reach	Bryo-1	2024-05-01	2	Etheostoma fonticola	23	1
3153	Old Channel Reach	Bryo-1	2024-05-01	2	Procambarus sp.		2
3153	Old Channel Reach	Bryo-1	2024-05-01	3	Etheostoma fonticola	21	1
3153	Old Channel Reach	Bryo-1	2024-05-01	3	Etheostoma fonticola	22	1
3153	Old Channel Reach	Bryo-1	2024-05-01	3	Etheostoma fonticola	22	1
3153	Old Channel Reach	Bryo-1	2024-05-01	3	Etheostoma fonticola	15	1
3153	Old Channel Reach	Bryo-1	2024-05-01	3	Etheostoma fonticola	12	1
3153	Old Channel Reach	Bryo-1	2024-05-01	3	Procambarus sp.		2
3153	Old Channel Reach	Bryo-1	2024-05-01	4	Etheostoma fonticola	26	1
3153	Old Channel Reach	Bryo-1	2024-05-01	4	Etheostoma fonticola	19	1
3153	Old Channel Reach	Bryo-1	2024-05-01	4	Etheostoma fonticola	19	1
3153	Old Channel Reach	Bryo-1	2024-05-01	5	Etheostoma fonticola	30	1
3153	Old Channel Reach	Bryo-1	2024-05-01	5	Etheostoma fonticola	23	1
3153	Old Channel Reach	Bryo-1	2024-05-01	6	Procambarus sp.		2
3153	Old Channel Reach	Bryo-1	2024-05-01	6	Etheostoma fonticola	23	1
3153	Old Channel Reach	Bryo-1	2024-05-01	6	Etheostoma fonticola	20	1
3153	Old Channel Reach	Bryo-1	2024-05-01	6	Etheostoma fonticola	26	1
3153	Old Channel Reach	Bryo-1	2024-05-01	7	Procambarus sp.		5
3153	Old Channel Reach	Bryo-1	2024-05-01	7	Palaemonetes sp.		1
3153	Old Channel Reach	Bryo-1	2024-05-01	7	Etheostoma fonticola	22	1
3153	Old Channel Reach	Bryo-1	2024-05-01	7	Etheostoma fonticola	22	1
3153	Old Channel Reach	Bryo-1	2024-05-01	8	Etheostoma fonticola	20	1
3153	Old Channel Reach	Bryo-1	2024-05-01	8	Etheostoma fonticola	28	1

3153	Old Channel Reach	Bryo-1	2024-05-01	8	Etheostoma fonticola	27	1
3153	Old Channel Reach	Bryo-1	2024-05-01	9	Etheostoma fonticola	25	1
3153	Old Channel Reach	Bryo-1	2024-05-01	9	Etheostoma fonticola	23	1
3153	Old Channel Reach	Bryo-1	2024-05-01	9	Etheostoma fonticola	21	1
3153	Old Channel Reach	Bryo-1	2024-05-01	9	Etheostoma fonticola	20	1
3153	Old Channel Reach	Bryo-1	2024-05-01	10	Procambarus sp.		2
3153	Old Channel Reach	Bryo-1	2024-05-01	10	Etheostoma fonticola	23	1
3153	Old Channel Reach	Bryo-1	2024-05-01	11	Etheostoma fonticola	20	1
3153	Old Channel Reach	Bryo-1	2024-05-01	11	Etheostoma fonticola	35	1
3153	Old Channel Reach	Bryo-1	2024-05-01	11	Etheostoma fonticola	23	1
3153	Old Channel Reach	Bryo-1	2024-05-01	11	Etheostoma fonticola	13	1
3153	Old Channel Reach	Bryo-1	2024-05-01	12	Procambarus sp.		1
3153	Old Channel Reach	Bryo-1	2024-05-01	13	Procambarus sp.		1
3153	Old Channel Reach	Bryo-1	2024-05-01	14	No fish collected		
3153	Old Channel Reach	Bryo-1	2024-05-01	15	No fish collected		
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	12	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	18	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	30	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	23	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	24	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	27	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	25	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	27	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	28	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	17	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	26	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	19	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	30	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	23	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	22	1

3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	20	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	14	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	19	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	28	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Etheostoma fonticola	20	1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Palaemonetes sp.		1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Procambarus sp.		1
3154	Old Channel Reach	Bryo-2	2024-05-01	1	Astyanax mexicanus	10	1
3154	Old Channel Reach	Bryo-2	2024-05-01	2	Procambarus sp.		4
3154	Old Channel Reach	Bryo-2	2024-05-01	2	Etheostoma fonticola	28	1
3154	Old Channel Reach	Bryo-2	2024-05-01	2	Etheostoma fonticola	24	1
3154	Old Channel Reach	Bryo-2	2024-05-01	2	Etheostoma fonticola	28	1
3154	Old Channel Reach	Bryo-2	2024-05-01	2	Etheostoma fonticola	30	1
3154	Old Channel Reach	Bryo-2	2024-05-01	3	Etheostoma fonticola	26	1
3154	Old Channel Reach	Bryo-2	2024-05-01	3	Etheostoma fonticola	34	1
3154	Old Channel Reach	Bryo-2	2024-05-01	3	Etheostoma fonticola	30	1
3154	Old Channel Reach	Bryo-2	2024-05-01	4	Procambarus sp.		3
3154	Old Channel Reach	Bryo-2	2024-05-01	4	Etheostoma fonticola	20	1
3154	Old Channel Reach	Bryo-2	2024-05-01	4	Etheostoma fonticola	21	1
3154	Old Channel Reach	Bryo-2	2024-05-01	4	Etheostoma fonticola	27	1
3154	Old Channel Reach	Bryo-2	2024-05-01	4	Etheostoma fonticola	23	1
3154	Old Channel Reach	Bryo-2	2024-05-01	4	Etheostoma fonticola	20	1
3154	Old Channel Reach	Bryo-2	2024-05-01	4	Etheostoma fonticola	26	1
3154	Old Channel Reach	Bryo-2	2024-05-01	4	Etheostoma fonticola	29	1
3154	Old Channel Reach	Bryo-2	2024-05-01	4	Etheostoma fonticola	12	1
3154	Old Channel Reach	Bryo-2	2024-05-01	5	Etheostoma fonticola	23	1
3154	Old Channel Reach	Bryo-2	2024-05-01	5	Etheostoma fonticola	30	1
3154	Old Channel Reach	Bryo-2	2024-05-01	5	Etheostoma fonticola	17	1
3154	Old Channel Reach	Bryo-2	2024-05-01	5	Etheostoma fonticola	26	1
3154	Old Channel Reach	Bryo-2	2024-05-01	5	Etheostoma fonticola	33	1

3154	Old Channel Reach	Bryo-2	2024-05-01	5	Etheostoma fonticola	20	1
3154	Old Channel Reach	Bryo-2	2024-05-01	5	Etheostoma fonticola	30	1
3154	Old Channel Reach	Bryo-2	2024-05-01	5	Etheostoma fonticola	22	1
3154	Old Channel Reach	Bryo-2	2024-05-01	6	Procambarus sp.		14
3154	Old Channel Reach	Bryo-2	2024-05-01	6	Etheostoma fonticola	29	1
3154	Old Channel Reach	Bryo-2	2024-05-01	6	Etheostoma fonticola	25	1
3154	Old Channel Reach	Bryo-2	2024-05-01	6	Etheostoma fonticola	27	1
3154	Old Channel Reach	Bryo-2	2024-05-01	7	Etheostoma fonticola	34	1
3154	Old Channel Reach	Bryo-2	2024-05-01	7	Procambarus sp.		4
3154	Old Channel Reach	Bryo-2	2024-05-01	8	Procambarus sp.		3
3154	Old Channel Reach	Bryo-2	2024-05-01	8	Etheostoma fonticola	24	1
3154	Old Channel Reach	Bryo-2	2024-05-01	9	Etheostoma fonticola	28	1
3154	Old Channel Reach	Bryo-2	2024-05-01	9	Etheostoma fonticola	28	1
3154	Old Channel Reach	Bryo-2	2024-05-01	9	Etheostoma fonticola	20	1
3154	Old Channel Reach	Bryo-2	2024-05-01	10	Etheostoma fonticola	19	1
3154	Old Channel Reach	Bryo-2	2024-05-01	10	Etheostoma fonticola	21	1
3154	Old Channel Reach	Bryo-2	2024-05-01	10	Etheostoma fonticola	25	1
3154	Old Channel Reach	Bryo-2	2024-05-01	10	Etheostoma fonticola	25	1
3154	Old Channel Reach	Bryo-2	2024-05-01	10	Etheostoma fonticola	27	1
3154	Old Channel Reach	Bryo-2	2024-05-01	10	Etheostoma fonticola	29	1
3154	Old Channel Reach	Bryo-2	2024-05-01	10	Etheostoma fonticola	28	1
3154	Old Channel Reach	Bryo-2	2024-05-01	10	Etheostoma fonticola	27	1
3154	Old Channel Reach	Bryo-2	2024-05-01	10	Etheostoma fonticola	18	1
3154	Old Channel Reach	Bryo-2	2024-05-01	10	Procambarus sp.		2
3154	Old Channel Reach	Bryo-2	2024-05-01	11	Etheostoma fonticola	30	1
3154	Old Channel Reach	Bryo-2	2024-05-01	11	Etheostoma fonticola	28	1
3154	Old Channel Reach	Bryo-2	2024-05-01	11	Etheostoma fonticola	31	1
3154	Old Channel Reach	Bryo-2	2024-05-01	11	Procambarus sp.		1
3154	Old Channel Reach	Bryo-2	2024-05-01	12	Procambarus sp.		1
3154	Old Channel Reach	Bryo-2	2024-05-01	13	Procambarus sp.		1

3154	Old Channel Reach	Bryo-2	2024-05-01	14	Etheostoma fonticola	29	1
3154	Old Channel Reach	Bryo-2	2024-05-01	14	Etheostoma fonticola	22	1
3154	Old Channel Reach	Bryo-2	2024-05-01	14	Etheostoma fonticola	24	1
3154	Old Channel Reach	Bryo-2	2024-05-01	14	Procambarus sp.		1
3154	Old Channel Reach	Bryo-2	2024-05-01	15	Etheostoma fonticola	31	1
3154	Old Channel Reach	Bryo-2	2024-05-01	16	No fish collected		
3155	Old Channel Reach	Lud-1	2024-05-01	1	Lepomis miniatus	48	1
3155	Old Channel Reach	Lud-1	2024-05-01	1	Palaemonetes sp.		8
3155	Old Channel Reach	Lud-1	2024-05-01	1	Etheostoma fonticola	22	1
3155	Old Channel Reach	Lud-1	2024-05-01	2	Etheostoma fonticola	23	1
3155	Old Channel Reach	Lud-1	2024-05-01	2	Palaemonetes sp.		5
3155	Old Channel Reach	Lud-1	2024-05-01	3	Etheostoma fonticola	21	1
3155	Old Channel Reach	Lud-1	2024-05-01	3	Etheostoma fonticola	29	1
3155	Old Channel Reach	Lud-1	2024-05-01	3	Palaemonetes sp.		2
3155	Old Channel Reach	Lud-1	2024-05-01	4	Etheostoma fonticola	22	1
3155	Old Channel Reach	Lud-1	2024-05-01	4	Palaemonetes sp.		9
3155	Old Channel Reach	Lud-1	2024-05-01	5	No fish collected		
3155	Old Channel Reach	Lud-1	2024-05-01	6	Palaemonetes sp.		4
3155	Old Channel Reach	Lud-1	2024-05-01	7	Etheostoma fonticola	23	1
3155	Old Channel Reach	Lud-1	2024-05-01	7	Etheostoma fonticola	24	1
3155	Old Channel Reach	Lud-1	2024-05-01	7	Palaemonetes sp.		4
3155	Old Channel Reach	Lud-1	2024-05-01	8	Palaemonetes sp.		1
3155	Old Channel Reach	Lud-1	2024-05-01	9	Gambusia sp.	24	1
3155	Old Channel Reach	Lud-1	2024-05-01	9	Etheostoma fonticola	30	1
3155	Old Channel Reach	Lud-1	2024-05-01	9	Palaemonetes sp.		1
3155	Old Channel Reach	Lud-1	2024-05-01	10	Palaemonetes sp.		2
3155	Old Channel Reach	Lud-1	2024-05-01	10	Etheostoma fonticola	20	1
3155	Old Channel Reach	Lud-1	2024-05-01	11	Etheostoma fonticola	23	1
3155	Old Channel Reach	Lud-1	2024-05-01	12	Etheostoma fonticola	20	1
3155	Old Channel Reach	Lud-1	2024-05-01	13	No fish collected		

3155	Old Channel Reach	Lud-1	2024-05-01	14	Palaemonetes sp.		1
3155	Old Channel Reach	Lud-1	2024-05-01	15	No fish collected		
3156	Old Channel Reach	Lud-2	2024-05-01	1	Herichthys cyanoguttatus	46	1
3156	Old Channel Reach	Lud-2	2024-05-01	1	Herichthys cyanoguttatus	65	1
3156	Old Channel Reach	Lud-2	2024-05-01	1	Dionda nigrotaeniata	35	1
3156	Old Channel Reach	Lud-2	2024-05-01	1	Procambarus sp.		2
3156	Old Channel Reach	Lud-2	2024-05-01	1	Etheostoma fonticola	17	1
3156	Old Channel Reach	Lud-2	2024-05-01	1	Etheostoma fonticola	17	1
3156	Old Channel Reach	Lud-2	2024-05-01	1	Palaemonetes sp.		4
3156	Old Channel Reach	Lud-2	2024-05-01	2	Dionda nigrotaeniata	34	1
3156	Old Channel Reach	Lud-2	2024-05-01	2	Palaemonetes sp.		1
3156	Old Channel Reach	Lud-2	2024-05-01	2	Etheostoma fonticola	13	1
3156	Old Channel Reach	Lud-2	2024-05-01	3	Etheostoma fonticola	22	1
3156	Old Channel Reach	Lud-2	2024-05-01	3	Etheostoma fonticola	18	1
3156	Old Channel Reach	Lud-2	2024-05-01	4	No fish collected		
3156	Old Channel Reach	Lud-2	2024-05-01	5	Procambarus sp.		1
3156	Old Channel Reach	Lud-2	2024-05-01	5	Herichthys cyanoguttatus	80	1
3156	Old Channel Reach	Lud-2	2024-05-01	5	Etheostoma fonticola	25	1
3156	Old Channel Reach	Lud-2	2024-05-01	5	Etheostoma fonticola	28	1
3156	Old Channel Reach	Lud-2	2024-05-01	5	Palaemonetes sp.		5
3156	Old Channel Reach	Lud-2	2024-05-01	6	Procambarus sp.		1
3156	Old Channel Reach	Lud-2	2024-05-01	7	Etheostoma fonticola	24	1
3156	Old Channel Reach	Lud-2	2024-05-01	7	Palaemonetes sp.		2
3156	Old Channel Reach	Lud-2	2024-05-01	8	Etheostoma fonticola	23	1
3156	Old Channel Reach	Lud-2	2024-05-01	8	Procambarus sp.		2
3156	Old Channel Reach	Lud-2	2024-05-01	9	No fish collected		
3156	Old Channel Reach	Lud-2	2024-05-01	10	Etheostoma fonticola	18	1
3156	Old Channel Reach	Lud-2	2024-05-01	11	Procambarus sp.		1
3156	Old Channel Reach	Lud-2	2024-05-01	12	Etheostoma fonticola	24	1
3156	Old Channel Reach	Lud-2	2024-05-01	12	Herichthys cyanoguttatus	49	1

3156	Old Channel Reach	Lud-2	2024-05-01	13	Procambarus sp.		1
3156	Old Channel Reach	Lud-2	2024-05-01	14	No fish collected		
3156	Old Channel Reach	Lud-2	2024-05-01	15	No fish collected		
3157	Old Channel Reach	Open-1	2024-05-01	1	No fish collected		
3157	Old Channel Reach	Open-1	2024-05-01	2	No fish collected		
3157	Old Channel Reach	Open-1	2024-05-01	3	No fish collected		
3157	Old Channel Reach	Open-1	2024-05-01	4	No fish collected		
3157	Old Channel Reach	Open-1	2024-05-01	5	No fish collected		
3157	Old Channel Reach	Open-1	2024-05-01	6	No fish collected		
3157	Old Channel Reach	Open-1	2024-05-01	7	No fish collected		
3157	Old Channel Reach	Open-1	2024-05-01	8	No fish collected		
3157	Old Channel Reach	Open-1	2024-05-01	9	No fish collected		
3157	Old Channel Reach	Open-1	2024-05-01	10	No fish collected		
3158	Old Channel Reach	Open-2	2024-05-01	1	No fish collected		
3158	Old Channel Reach	Open-2	2024-05-01	2	No fish collected		
3158	Old Channel Reach	Open-2	2024-05-01	3	No fish collected		
3158	Old Channel Reach	Open-2	2024-05-01	4	Notropis amabilis	21	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	35	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	26	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	38	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	25	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	35	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	33	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	25	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	34	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	34	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	28	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	23	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	34	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	26	1

3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	30	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	27	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	29	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	30	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	23	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	32	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	21	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	30	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	24	1
3158	Old Channel Reach	Open-2	2024-05-01	5	Notropis amabilis	28	1
3158	Old Channel Reach	Open-2	2024-05-01	6	Notropis amabilis	34	1
3158	Old Channel Reach	Open-2	2024-05-01	6	Notropis amabilis	32	1
3158	Old Channel Reach	Open-2	2024-05-01	6	Notropis amabilis	31	1
3158	Old Channel Reach	Open-2	2024-05-01	6	Notropis amabilis	30	1
3158	Old Channel Reach	Open-2	2024-05-01	6	Notropis amabilis	30	1
3158	Old Channel Reach	Open-2	2024-05-01	6	Notropis amabilis	31	1
3158	Old Channel Reach	Open-2	2024-05-01	6	Notropis amabilis	31	1
3158	Old Channel Reach	Open-2	2024-05-01	6	Notropis amabilis	28	1
3158	Old Channel Reach	Open-2	2024-05-01	6	Notropis amabilis	26	1
3158	Old Channel Reach	Open-2	2024-05-01	6	Notropis amabilis	35	1
3158	Old Channel Reach	Open-2	2024-05-01	7	No fish collected		
3158	Old Channel Reach	Open-2	2024-05-01	8	No fish collected		
3158	Old Channel Reach	Open-2	2024-05-01	9	No fish collected		
3158	Old Channel Reach	Open-2	2024-05-01	10	No fish collected		
3158	Old Channel Reach	Open-2	2024-05-01	11	No fish collected		
3158	Old Channel Reach	Open-2	2024-05-01	12	No fish collected		
3158	Old Channel Reach	Open-2	2024-05-01	13	No fish collected		
3158	Old Channel Reach	Open-2	2024-05-01	14	No fish collected		
3158	Old Channel Reach	Open-2	2024-05-01	15	No fish collected		
3159	Upper New Channel Reach	Cab-1	2024-05-01	1	Etheostoma fonticola	32	1

3159	Upper New Channel Reach	Cab-1	2024-05-01	1	Etheostoma fonticola	32	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	1	Etheostoma fonticola	15	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	1	Etheostoma fonticola	20	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	2	Etheostoma fonticola	23	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	2	Etheostoma fonticola	30	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	2	Etheostoma fonticola	16	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	2	Etheostoma fonticola	17	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	3	Etheostoma fonticola	33	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	3	Etheostoma fonticola	20	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	3	Etheostoma fonticola	32	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	3	Etheostoma fonticola	28	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	3	Etheostoma fonticola	25	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	3	Etheostoma fonticola	29	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	3	Etheostoma fonticola	21	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	4	Procambarus sp.		1
3159	Upper New Channel Reach	Cab-1	2024-05-01	4	Etheostoma fonticola	33	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	5	Procambarus sp.		1
3159	Upper New Channel Reach	Cab-1	2024-05-01	5	Lepomis cyanellus	58	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	6	Procambarus sp.		1
3159	Upper New Channel Reach	Cab-1	2024-05-01	6	Etheostoma fonticola	30	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	6	Etheostoma fonticola	30	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	6	Etheostoma fonticola	32	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	7	Etheostoma fonticola	26	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	7	Etheostoma fonticola	30	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	7	Etheostoma fonticola	15	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	7	Lepomis gulosus	59	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	7	Procambarus sp.		3
3159	Upper New Channel Reach	Cab-1	2024-05-01	7	Lepomis cyanellus	51	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	8	Etheostoma fonticola	26	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	8	Procambarus sp.		1

3159	Upper New Channel Reach	Cab-1	2024-05-01	9	Etheostoma fonticola	30	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	10	Etheostoma fonticola	19	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	11	Procambarus sp.		1
3159	Upper New Channel Reach	Cab-1	2024-05-01	11	Etheostoma fonticola	29	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	12	Etheostoma fonticola	22	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	12	Etheostoma fonticola	15	1
3159	Upper New Channel Reach	Cab-1	2024-05-01	13	No fish collected		
3159	Upper New Channel Reach	Cab-1	2024-05-01	14	Procambarus sp.		1
3159	Upper New Channel Reach	Cab-1	2024-05-01	15	Procambarus sp.		1
3160	Upper New Channel Reach	Cab-2	2024-05-01	1	Lepomis gulosus	55	1
3160	Upper New Channel Reach	Cab-2	2024-05-01	1	Lepomis cyanellus	66	1
3160	Upper New Channel Reach	Cab-2	2024-05-01	1	Lepomis cyanellus	50	1
3160	Upper New Channel Reach	Cab-2	2024-05-01	2	Procambarus sp.		3
3160	Upper New Channel Reach	Cab-2	2024-05-01	3	Etheostoma fonticola	26	1
3160	Upper New Channel Reach	Cab-2	2024-05-01	3	Etheostoma fonticola	20	1
3160	Upper New Channel Reach	Cab-2	2024-05-01	4	No fish collected		
3160	Upper New Channel Reach	Cab-2	2024-05-01	5	Procambarus sp.		2
3160	Upper New Channel Reach	Cab-2	2024-05-01	5	Lepomis gulosus	64	1
3160	Upper New Channel Reach	Cab-2	2024-05-01	6	Procambarus sp.		1
3160	Upper New Channel Reach	Cab-2	2024-05-01	6	Etheostoma fonticola	30	1
3160	Upper New Channel Reach	Cab-2	2024-05-01	7	No fish collected		
3160	Upper New Channel Reach	Cab-2	2024-05-01	8	Procambarus sp.		1
3160	Upper New Channel Reach	Cab-2	2024-05-01	8	Lepomis miniatus	72	1
3160	Upper New Channel Reach	Cab-2	2024-05-01	9	Procambarus sp.		3
3160	Upper New Channel Reach	Cab-2	2024-05-01	9	Etheostoma fonticola	24	1
3160	Upper New Channel Reach	Cab-2	2024-05-01	10	Etheostoma fonticola	29	1
3160	Upper New Channel Reach	Cab-2	2024-05-01	11	No fish collected		
3160	Upper New Channel Reach	Cab-2	2024-05-01	12	Procambarus sp.		2
3160	Upper New Channel Reach	Cab-2	2024-05-01	12	Palaemonetes sp.		1
3160	Upper New Channel Reach	Cab-2	2024-05-01	13	Procambarus sp.		1

3160	Upper New Channel Reach	Cab-2	2024-05-01	14	Procambarus sp.		1
3160	Upper New Channel Reach	Cab-2	2024-05-01	14	Lepomis miniatus	45	1
3160	Upper New Channel Reach	Cab-2	2024-05-01	15	No fish collected		
3161	Upper New Channel Reach	Hyg-1	2024-05-01	1	Procambarus sp.		6
3161	Upper New Channel Reach	Hyg-1	2024-05-01	1	Etheostoma fonticola	34	1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	1	Palaemonetes sp.		2
3161	Upper New Channel Reach	Hyg-1	2024-05-01	1	Lepomis miniatus	50	1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	1	Micropterus salmoides	32	1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	1	Ambloplites rupestris	24	1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	1	Ambloplites rupestris	17	1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	2	Procambarus sp.		3
3161	Upper New Channel Reach	Hyg-1	2024-05-01	2	Lepomis sp.	15	1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	2	Etheostoma fonticola	32	1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	2	Etheostoma fonticola	32	1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	2	Palaemonetes sp.		2
3161	Upper New Channel Reach	Hyg-1	2024-05-01	3	Procambarus sp.		5
3161	Upper New Channel Reach	Hyg-1	2024-05-01	3	Lepomis gulosus	60	1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	3	Palaemonetes sp.		1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	4	Procambarus sp.		1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	4	Palaemonetes sp.		1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	5	Procambarus sp.		1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	6	Palaemonetes sp.		1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	7	Procambarus sp.		2
3161	Upper New Channel Reach	Hyg-1	2024-05-01	7	Ambloplites rupestris	20	1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	8	Procambarus sp.		1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	9	Palaemonetes sp.		2
3161	Upper New Channel Reach	Hyg-1	2024-05-01	10	No fish collected		
3161	Upper New Channel Reach	Hyg-1	2024-05-01	11	Etheostoma fonticola	28	1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	11	Lepomis miniatus	31	1
3161	Upper New Channel Reach	Hyg-1	2024-05-01	12	Palaemonetes sp.		1

3161	Upper New Channel Reach	Hyg-1	2024-05-01	13	No fish collected		
3161	Upper New Channel Reach	Hyg-1	2024-05-01	14	No fish collected		
3161	Upper New Channel Reach	Hyg-1	2024-05-01	15	No fish collected		
3161	Upper New Channel Reach	Hyg-1	2024-05-01	6	Procambarus sp.		1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Lepomis gulosus	51	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Lepomis gulosus	62	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Lepomis gulosus	63	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Lepomis miniatus	46	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Astyanax mexicanus	35	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Astyanax mexicanus	25	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Etheostoma fonticola	28	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Etheostoma fonticola	28	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Procambarus sp.		2
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Palaemonetes sp.		18
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Ambloplites rupestris	20	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Lepomis cyanellus	51	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Lepomis cyanellus	55	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Micropterus salmoides	52	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	1	Micropterus salmoides	46	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	2	Procambarus sp.		4
3162	Upper New Channel Reach	Hyg-2	2024-05-01	2	Etheostoma fonticola	31	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	2	Etheostoma fonticola	20	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	2	Etheostoma fonticola	32	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	2	Palaemonetes sp.		3
3162	Upper New Channel Reach	Hyg-2	2024-05-01	2	Micropterus salmoides	34	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	3	Procambarus sp.		3
3162	Upper New Channel Reach	Hyg-2	2024-05-01	3	Lepomis miniatus	36	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	4	Procambarus sp.		7
3162	Upper New Channel Reach	Hyg-2	2024-05-01	4	Ameiurus natalis	93	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	5	Procambarus sp.		4

3162	Upper New Channel Reach	Hyg-2	2024-05-01	5	Palaemonetes sp.		2
3162	Upper New Channel Reach	Hyg-2	2024-05-01	5	Lepomis cyanellus	54	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	6	Procambarus sp.		4
3162	Upper New Channel Reach	Hyg-2	2024-05-01	6	Palaemonetes sp.		2
3162	Upper New Channel Reach	Hyg-2	2024-05-01	7	Procambarus sp.		2
3162	Upper New Channel Reach	Hyg-2	2024-05-01	7	Palaemonetes sp.		1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	8	Procambarus sp.		4
3162	Upper New Channel Reach	Hyg-2	2024-05-01	8	Micropterus salmoides	40	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	8	Palaemonetes sp.		1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	9	Procambarus sp.		1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	9	Lepomis gulosus	59	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	10	Procambarus sp.		1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	11	Procambarus sp.		2
3162	Upper New Channel Reach	Hyg-2	2024-05-01	11	Lepomis miniatus	57	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	12	Lepomis miniatus	56	1
3162	Upper New Channel Reach	Hyg-2	2024-05-01	13	No fish collected		
3162	Upper New Channel Reach	Hyg-2	2024-05-01	14	No fish collected		
3162	Upper New Channel Reach	Hyg-2	2024-05-01	15	Procambarus sp.		2
3162	Upper New Channel Reach	Hyg-2	2024-05-01	15	Palaemonetes sp.		1
3163	Upper New Channel Reach	Open-1	2024-05-01	1	No fish collected		
3163	Upper New Channel Reach	Open-1	2024-05-01	2	No fish collected		
3163	Upper New Channel Reach	Open-1	2024-05-01	3	No fish collected		
3163	Upper New Channel Reach	Open-1	2024-05-01	4	No fish collected		
3163	Upper New Channel Reach	Open-1	2024-05-01	5	Lepomis cyanellus	75	1
3163	Upper New Channel Reach	Open-1	2024-05-01	6	No fish collected		
3163	Upper New Channel Reach	Open-1	2024-05-01	7	No fish collected		
3163	Upper New Channel Reach	Open-1	2024-05-01	8	No fish collected		
3163	Upper New Channel Reach	Open-1	2024-05-01	9	No fish collected		
3163	Upper New Channel Reach	Open-1	2024-05-01	10	No fish collected		
3163	Upper New Channel Reach	Open-1	2024-05-01	11	No fish collected		

3163	Upper New Channel Reach	Open-1	2024-05-01	12	No fish collected		
3163	Upper New Channel Reach	Open-1	2024-05-01	13	No fish collected		
3163	Upper New Channel Reach	Open-1	2024-05-01	14	No fish collected		
3163	Upper New Channel Reach	Open-1	2024-05-01	15	No fish collected		
3164	Upper New Channel Reach	Open-2	2024-05-01	1	No fish collected		
3164	Upper New Channel Reach	Open-2	2024-05-01	2	No fish collected		
3164	Upper New Channel Reach	Open-2	2024-05-01	3	No fish collected		
3164	Upper New Channel Reach	Open-2	2024-05-01	4	No fish collected		
3164	Upper New Channel Reach	Open-2	2024-05-01	5	No fish collected		
3164	Upper New Channel Reach	Open-2	2024-05-01	6	No fish collected		
3164	Upper New Channel Reach	Open-2	2024-05-01	7	No fish collected		
3164	Upper New Channel Reach	Open-2	2024-05-01	8	No fish collected		
3164	Upper New Channel Reach	Open-2	2024-05-01	9	No fish collected		
3164	Upper New Channel Reach	Open-2	2024-05-01	10	No fish collected		
3165	Upper Spring Run	Open-1	2024-06-11	1	No fish collected		
3165	Upper Spring Run	Open-1	2024-06-11	2	No fish collected		
3165	Upper Spring Run	Open-1	2024-06-11	3	No fish collected		
3165	Upper Spring Run	Open-1	2024-06-11	4	No fish collected		
3165	Upper Spring Run	Open-1	2024-06-11	5	No fish collected		
3165	Upper Spring Run	Open-1	2024-06-11	6	No fish collected		
3165	Upper Spring Run	Open-1	2024-06-11	7	Gambusia sp.	27	1
3165	Upper Spring Run	Open-1	2024-06-11	8	No fish collected		
3165	Upper Spring Run	Open-1	2024-06-11	9	No fish collected		
3165	Upper Spring Run	Open-1	2024-06-11	10	No fish collected		
3165	Upper Spring Run	Open-1	2024-06-11	11	No fish collected		
3165	Upper Spring Run	Open-1	2024-06-11	12	No fish collected		
3165	Upper Spring Run	Open-1	2024-06-11	13	No fish collected		
3165	Upper Spring Run	Open-1	2024-06-11	14	No fish collected		
3165	Upper Spring Run	Open-1	2024-06-11	15	No fish collected		
3166	Upper Spring Run	Sag-1	2024-06-11	1	Gambusia sp.	35	1

3166	Upper Spring Run	Sag-1	2024-06-11	1	Gambusia sp.	27	1
3166	Upper Spring Run	Sag-1	2024-06-11	1	Gambusia sp.	21	1
3166	Upper Spring Run	Sag-1	2024-06-11	1	Gambusia sp.	19	1
3166	Upper Spring Run	Sag-1	2024-06-11	1	Gambusia sp.	20	1
3166	Upper Spring Run	Sag-1	2024-06-11	1	Gambusia sp.	14	1
3166	Upper Spring Run	Sag-1	2024-06-11	1	Gambusia sp.	15	1
3166	Upper Spring Run	Sag-1	2024-06-11	1	Herichthys cyanoguttatus	68	1
3166	Upper Spring Run	Sag-1	2024-06-11	1	Astyanax mexicanus	36	1
3166	Upper Spring Run	Sag-1	2024-06-11	1	Lepomis miniatus	46	1
3166	Upper Spring Run	Sag-1	2024-06-11	1	Lepomis miniatus	45	1
3166	Upper Spring Run	Sag-1	2024-06-11	1	Lepomis miniatus	37	1
3166	Upper Spring Run	Sag-1	2024-06-11	1	Procambarus sp.		1
3166	Upper Spring Run	Sag-1	2024-06-11	1	Palaemonetes sp.		1
3166	Upper Spring Run	Sag-1	2024-06-11	1	Micropterus salmoides	45	1
3166	Upper Spring Run	Sag-1	2024-06-11	2	Procambarus sp.		1
3166	Upper Spring Run	Sag-1	2024-06-11	2	Gambusia sp.	13	1
3166	Upper Spring Run	Sag-1	2024-06-11	2	Gambusia sp.	22	1
3166	Upper Spring Run	Sag-1	2024-06-11	2	Gambusia sp.	24	1
3166	Upper Spring Run	Sag-1	2024-06-11	2	Gambusia sp.	18	1
3166	Upper Spring Run	Sag-1	2024-06-11	2	Gambusia sp.	19	1
3166	Upper Spring Run	Sag-1	2024-06-11	2	Gambusia sp.	27	1
3166	Upper Spring Run	Sag-1	2024-06-11	2	Micropterus salmoides	55	1
3166	Upper Spring Run	Sag-1	2024-06-11	3	Procambarus sp.		4
3166	Upper Spring Run	Sag-1	2024-06-11	3	Lepomis miniatus	42	1
3166	Upper Spring Run	Sag-1	2024-06-11	3	Lepomis sp.	11	1
3166	Upper Spring Run	Sag-1	2024-06-11	3	Gambusia sp.	22	1
3166	Upper Spring Run	Sag-1	2024-06-11	4	Lepomis miniatus	65	1
3166	Upper Spring Run	Sag-1	2024-06-11	4	Procambarus sp.		1
3166	Upper Spring Run	Sag-1	2024-06-11	5	Procambarus sp.		1
3166	Upper Spring Run	Sag-1	2024-06-11	5	Gambusia sp.	27	1

3166	Upper Spring Run	Sag-1	2024-06-11	6	Herichthys cyanoguttatus	106	1
3166	Upper Spring Run	Sag-1	2024-06-11	7	Procambarus sp.		1
3166	Upper Spring Run	Sag-1	2024-06-11	8	Lepomis miniatus	44	1
3166	Upper Spring Run	Sag-1	2024-06-11	9	No fish collected		
3166	Upper Spring Run	Sag-1	2024-06-11	10	Procambarus sp.		1
3166	Upper Spring Run	Sag-1	2024-06-11	11	Lepomis miniatus	125	1
3166	Upper Spring Run	Sag-1	2024-06-11	12	Procambarus sp.		1
3166	Upper Spring Run	Sag-1	2024-06-11	13	No fish collected		
3166	Upper Spring Run	Sag-1	2024-06-11	14	Procambarus sp.		1
3166	Upper Spring Run	Sag-1	2024-06-11	15	No fish collected		
3167	Upper Spring Run	Sag-2	2024-06-11	1	No fish collected		
3167	Upper Spring Run	Sag-2	2024-06-11	2	No fish collected		
3167	Upper Spring Run	Sag-2	2024-06-11	3	Procambarus sp.		1
3167	Upper Spring Run	Sag-2	2024-06-11	3	Lepomis miniatus	50	1
3167	Upper Spring Run	Sag-2	2024-06-11	3	Etheostoma fonticola	29	1
3167	Upper Spring Run	Sag-2	2024-06-11	4	No fish collected		
3167	Upper Spring Run	Sag-2	2024-06-11	5	No fish collected		
3167	Upper Spring Run	Sag-2	2024-06-11	6	No fish collected		
3167	Upper Spring Run	Sag-2	2024-06-11	7	Gambusia sp.	18	1
3167	Upper Spring Run	Sag-2	2024-06-11	8	Procambarus sp.		2
3167	Upper Spring Run	Sag-2	2024-06-11	8	Lepomis miniatus	42	1
3167	Upper Spring Run	Sag-2	2024-06-11	9	No fish collected		
3167	Upper Spring Run	Sag-2	2024-06-11	10	Lepomis miniatus	86	1
3167	Upper Spring Run	Sag-2	2024-06-11	11	No fish collected		
3167	Upper Spring Run	Sag-2	2024-06-11	12	No fish collected		
3167	Upper Spring Run	Sag-2	2024-06-11	13	No fish collected		
3167	Upper Spring Run	Sag-2	2024-06-11	14	No fish collected		
3167	Upper Spring Run	Sag-2	2024-06-11	15	Procambarus sp.		1
3168	Upper Spring Run	Open-2	2024-06-11	1	No fish collected		
3168	Upper Spring Run	Open-2	2024-06-11	2	No fish collected		

3168	Upper Spring Run	Open-2	2024-06-11	3	No fish collected		
3168	Upper Spring Run	Open-2	2024-06-11	4	No fish collected		
3168	Upper Spring Run	Open-2	2024-06-11	5	No fish collected		
3168	Upper Spring Run	Open-2	2024-06-11	6	No fish collected		
3168	Upper Spring Run	Open-2	2024-06-11	7	No fish collected		
3168	Upper Spring Run	Open-2	2024-06-11	8	No fish collected		
3168	Upper Spring Run	Open-2	2024-06-11	9	No fish collected		
3168	Upper Spring Run	Open-2	2024-06-11	10	No fish collected		
3169	Upper Spring Run	Algae-1	2024-06-11	1	Lepomis miniatus	40	1
3169	Upper Spring Run	Algae-1	2024-06-11	1	Palaemonetes sp.		1
3169	Upper Spring Run	Algae-1	2024-06-11	1	Etheostoma lepidum	37	1
3169	Upper Spring Run	Algae-1	2024-06-11	1	Micropterus salmoides	44	1
3169	Upper Spring Run	Algae-1	2024-06-11	1	Herichthys cyanoguttatus	32	1
3169	Upper Spring Run	Algae-1	2024-06-11	2	Procambarus sp.		2
3169	Upper Spring Run	Algae-1	2024-06-11	3	No fish collected		
3169	Upper Spring Run	Algae-1	2024-06-11	4	Palaemonetes sp.		1
3169	Upper Spring Run	Algae-1	2024-06-11	4	Etheostoma fonticola	30	1
3169	Upper Spring Run	Algae-1	2024-06-11	4	Etheostoma fonticola	31	1
3169	Upper Spring Run	Algae-1	2024-06-11	5	No fish collected		
3169	Upper Spring Run	Algae-1	2024-06-11	6	Procambarus sp.		1
3169	Upper Spring Run	Algae-1	2024-06-11	7	No fish collected		
3169	Upper Spring Run	Algae-1	2024-06-11	8	Procambarus sp.		1
3169	Upper Spring Run	Algae-1	2024-06-11	9	No fish collected		
3169	Upper Spring Run	Algae-1	2024-06-11	10	Etheostoma fonticola	29	1
3169	Upper Spring Run	Algae-1	2024-06-11	10	Etheostoma fonticola	33	1
3169	Upper Spring Run	Algae-1	2024-06-11	10	Etheostoma lepidum	50	1
3169	Upper Spring Run	Algae-1	2024-06-11	11	Etheostoma fonticola	34	1
3169	Upper Spring Run	Algae-1	2024-06-11	12	Etheostoma fonticola	35	1
3169	Upper Spring Run	Algae-1	2024-06-11	12	Procambarus sp.		1
3169	Upper Spring Run	Algae-1	2024-06-11	13	No fish collected		

3169	Upper Spring Run	Algae-1	2024-06-11	14	No fish collected		
3169	Upper Spring Run	Algae-1	2024-06-11	15	No fish collected		
3170	Upper Spring Run	Algae-2	2024-06-11	1	Lepomis miniatus	78	1
3170	Upper Spring Run	Algae-2	2024-06-11	1	Lepomis miniatus	25	1
3170	Upper Spring Run	Algae-2	2024-06-11	1	Etheostoma lepidum	48	1
3170	Upper Spring Run	Algae-2	2024-06-11	1	Palaemonetes sp.		1
3170	Upper Spring Run	Algae-2	2024-06-11	2	No fish collected		
3170	Upper Spring Run	Algae-2	2024-06-11	3	Gambusia sp.	16	1
3170	Upper Spring Run	Algae-2	2024-06-11	4	Etheostoma fonticola	32	1
3170	Upper Spring Run	Algae-2	2024-06-11	5	Palaemonetes sp.		1
3170	Upper Spring Run	Algae-2	2024-06-11	6	No fish collected		
3170	Upper Spring Run	Algae-2	2024-06-11	7	No fish collected		
3170	Upper Spring Run	Algae-2	2024-06-11	8	No fish collected		
3170	Upper Spring Run	Algae-2	2024-06-11	9	Etheostoma fonticola	31	1
3170	Upper Spring Run	Algae-2	2024-06-11	10	No fish collected		
3170	Upper Spring Run	Algae-2	2024-06-11	11	No fish collected		
3170	Upper Spring Run	Algae-2	2024-06-11	12	No fish collected		
3170	Upper Spring Run	Algae-2	2024-06-11	13	No fish collected		
3170	Upper Spring Run	Algae-2	2024-06-11	14	No fish collected		
3170	Upper Spring Run	Algae-2	2024-06-11	15	No fish collected		
3171	Upper Spring Run	Bryo-1	2024-06-11	1	Micropterus salmoides	88	1
3171	Upper Spring Run	Bryo-1	2024-06-11	1	Micropterus salmoides	74	1
3171	Upper Spring Run	Bryo-1	2024-06-11	2	Lepomis miniatus	62	1
3171	Upper Spring Run	Bryo-1	2024-06-11	3	Palaemonetes sp.		1
3171	Upper Spring Run	Bryo-1	2024-06-11	3	Lepomis sp.	18	1
3171	Upper Spring Run	Bryo-1	2024-06-11	4	No fish collected		
3171	Upper Spring Run	Bryo-1	2024-06-11	5	Micropterus salmoides	38	1
3171	Upper Spring Run	Bryo-1	2024-06-11	6	No fish collected		
3171	Upper Spring Run	Bryo-1	2024-06-11	7	No fish collected		
3171	Upper Spring Run	Bryo-1	2024-06-11	8	No fish collected		

3171	Upper Spring Run	Bryo-1	2024-06-11	9	No fish collected		
3171	Upper Spring Run	Bryo-1	2024-06-11	10	No fish collected		
3171	Upper Spring Run	Bryo-1	2024-06-11	11	No fish collected		
3171	Upper Spring Run	Bryo-1	2024-06-11	12	Palaemonetes sp.		1
3171	Upper Spring Run	Bryo-1	2024-06-11	13	No fish collected		
3171	Upper Spring Run	Bryo-1	2024-06-11	14	No fish collected		
3171	Upper Spring Run	Bryo-1	2024-06-11	15	No fish collected		
3172	Upper Spring Run	Bryo-2	2024-06-11	1	Procambarus sp.		3
3172	Upper Spring Run	Bryo-2	2024-06-11	1	Etheostoma fonticola	26	1
3172	Upper Spring Run	Bryo-2	2024-06-11	1	Etheostoma fonticola	25	1
3172	Upper Spring Run	Bryo-2	2024-06-11	1	Etheostoma fonticola	14	1
3172	Upper Spring Run	Bryo-2	2024-06-11	1	Etheostoma fonticola	26	1
3172	Upper Spring Run	Bryo-2	2024-06-11	2	Procambarus sp.		1
3172	Upper Spring Run	Bryo-2	2024-06-11	3	Etheostoma fonticola	30	1
3172	Upper Spring Run	Bryo-2	2024-06-11	3	Palaemonetes sp.		1
3172	Upper Spring Run	Bryo-2	2024-06-11	3	Herichthys cyanoguttatus	15	1
3172	Upper Spring Run	Bryo-2	2024-06-11	4	Etheostoma fonticola	30	1
3172	Upper Spring Run	Bryo-2	2024-06-11	4	Etheostoma fonticola	20	1
3172	Upper Spring Run	Bryo-2	2024-06-11	5	Etheostoma fonticola	26	1
3172	Upper Spring Run	Bryo-2	2024-06-11	5	Etheostoma fonticola	22	1
3172	Upper Spring Run	Bryo-2	2024-06-11	5	Etheostoma fonticola	30	1
3172	Upper Spring Run	Bryo-2	2024-06-11	6	Etheostoma fonticola	26	1
3172	Upper Spring Run	Bryo-2	2024-06-11	6	Etheostoma fonticola	27	1
3172	Upper Spring Run	Bryo-2	2024-06-11	6	Etheostoma fonticola	30	1
3172	Upper Spring Run	Bryo-2	2024-06-11	6	Etheostoma fonticola	13	1
3172	Upper Spring Run	Bryo-2	2024-06-11	6	Procambarus sp.		1
3172	Upper Spring Run	Bryo-2	2024-06-11	7	Procambarus sp.		1
3172	Upper Spring Run	Bryo-2	2024-06-11	8	Etheostoma lepidum	35	1
3172	Upper Spring Run	Bryo-2	2024-06-11	9	No fish collected		
3172	Upper Spring Run	Bryo-2	2024-06-11	10	Etheostoma fonticola	31	1

3172	Upper Spring Run	Bryo-2	2024-06-11	10	Etheostoma fonticola	32	1
3172	Upper Spring Run	Bryo-2	2024-06-11	11	Etheostoma fonticola	10	1
3172	Upper Spring Run	Bryo-2	2024-06-11	12	Etheostoma fonticola	32	1
3172	Upper Spring Run	Bryo-2	2024-06-11	12	Etheostoma fonticola	29	1
3172	Upper Spring Run	Bryo-2	2024-06-11	12	Procambarus sp.		1
3172	Upper Spring Run	Bryo-2	2024-06-11	13	No fish collected		
3172	Upper Spring Run	Bryo-2	2024-06-11	14	Etheostoma fonticola	21	1
3172	Upper Spring Run	Bryo-2	2024-06-11	14	Etheostoma fonticola	22	1
3172	Upper Spring Run	Bryo-2	2024-06-11	15	No fish collected		
3173	Landa Lake	Sag-1	2024-06-12	1	Etheostoma fonticola	30	1
3173	Landa Lake	Sag-1	2024-06-12	1	Etheostoma fonticola	23	1
3173	Landa Lake	Sag-1	2024-06-12	1	Lepomis miniatus	40	1
3173	Landa Lake	Sag-1	2024-06-12	1	Lepomis miniatus	31	1
3173	Landa Lake	Sag-1	2024-06-12	1	Dionda nigrotaeniata	32	1
3173	Landa Lake	Sag-1	2024-06-12	1	Dionda nigrotaeniata	48	1
3173	Landa Lake	Sag-1	2024-06-12	1	Dionda nigrotaeniata	37	1
3173	Landa Lake	Sag-1	2024-06-12	1	Procambarus sp.		1
3173	Landa Lake	Sag-1	2024-06-12	1	Palaemonetes sp.		7
3173	Landa Lake	Sag-1	2024-06-12	2	Procambarus sp.		3
3173	Landa Lake	Sag-1	2024-06-12	2	Palaemonetes sp.		2
3173	Landa Lake	Sag-1	2024-06-12	2	Lepomis miniatus	66	1
3173	Landa Lake	Sag-1	2024-06-12	2	Lepomis miniatus	48	1
3173	Landa Lake	Sag-1	2024-06-12	2	Lepomis miniatus	25	1
3173	Landa Lake	Sag-1	2024-06-12	2	Dionda nigrotaeniata	38	1
3173	Landa Lake	Sag-1	2024-06-12	2	Dionda nigrotaeniata	35	1
3173	Landa Lake	Sag-1	2024-06-12	2	Ameiurus natalis	62	1
3173	Landa Lake	Sag-1	2024-06-12	2	Etheostoma fonticola	22	1
3173	Landa Lake	Sag-1	2024-06-12	2	Etheostoma fonticola	24	1
3173	Landa Lake	Sag-1	2024-06-12	3	Procambarus sp.		1
3173	Landa Lake	Sag-1	2024-06-12	3	Dionda nigrotaeniata	28	1

3173	Landa Lake	Sag-1	2024-06-12	3	Dionda nigrotaeniata	31	1
3173	Landa Lake	Sag-1	2024-06-12	3	Dionda nigrotaeniata	32	1
3173	Landa Lake	Sag-1	2024-06-12	3	Dionda nigrotaeniata	30	1
3173	Landa Lake	Sag-1	2024-06-12	3	Etheostoma fonticola	30	1
3173	Landa Lake	Sag-1	2024-06-12	3	Lepomis miniatus	72	1
3173	Landa Lake	Sag-1	2024-06-12	3	Lepomis miniatus	34	1
3173	Landa Lake	Sag-1	2024-06-12	4	Lepomis miniatus	45	1
3173	Landa Lake	Sag-1	2024-06-12	4	Etheostoma fonticola	29	1
3173	Landa Lake	Sag-1	2024-06-12	4	Procambarus sp.		1
3173	Landa Lake	Sag-1	2024-06-12	4	Palaemonetes sp.		1
3173	Landa Lake	Sag-1	2024-06-12	5	Palaemonetes sp.		3
3173	Landa Lake	Sag-1	2024-06-12	5	Etheostoma fonticola	30	1
3173	Landa Lake	Sag-1	2024-06-12	5	Etheostoma fonticola	24	1
3173	Landa Lake	Sag-1	2024-06-12	6	Procambarus sp.		2
3173	Landa Lake	Sag-1	2024-06-12	7	Dionda nigrotaeniata	31	1
3173	Landa Lake	Sag-1	2024-06-12	7	Dionda nigrotaeniata	35	1
3173	Landa Lake	Sag-1	2024-06-12	7	Dionda nigrotaeniata	35	1
3173	Landa Lake	Sag-1	2024-06-12	7	Dionda nigrotaeniata	22	1
3173	Landa Lake	Sag-1	2024-06-12	7	Etheostoma fonticola	26	1
3173	Landa Lake	Sag-1	2024-06-12	8	Etheostoma fonticola	33	1
3173	Landa Lake	Sag-1	2024-06-12	9	Procambarus sp.		1
3173	Landa Lake	Sag-1	2024-06-12	9	Lepomis miniatus	44	1
3173	Landa Lake	Sag-1	2024-06-12	9	Dionda nigrotaeniata	32	1
3173	Landa Lake	Sag-1	2024-06-12	10	Etheostoma fonticola	19	1
3173	Landa Lake	Sag-1	2024-06-12	11	Procambarus sp.		3
3173	Landa Lake	Sag-1	2024-06-12	11	Dionda nigrotaeniata	26	1
3173	Landa Lake	Sag-1	2024-06-12	11	Dionda nigrotaeniata	41	1
3173	Landa Lake	Sag-1	2024-06-12	12	Lepomis miniatus	47	1
3173	Landa Lake	Sag-1	2024-06-12	12	Dionda nigrotaeniata	29	1
3173	Landa Lake	Sag-1	2024-06-12	13	No fish collected		

3173	Landa Lake	Sag-1	2024-06-12	14	No fish collected		
3173	Landa Lake	Sag-1	2024-06-12	15	No fish collected		
3174	Landa Lake	Sag-2	2024-06-12	1	Lepomis miniatus	39	1
3174	Landa Lake	Sag-2	2024-06-12	1	Lepomis miniatus	55	1
3174	Landa Lake	Sag-2	2024-06-12	1	Procambarus sp.		2
3174	Landa Lake	Sag-2	2024-06-12	1	Palaemonetes sp.		10
3174	Landa Lake	Sag-2	2024-06-12	2	Procambarus sp.		6
3174	Landa Lake	Sag-2	2024-06-12	2	Ameiurus natalis	36	1
3174	Landa Lake	Sag-2	2024-06-12	2	Etheostoma fonticola	25	1
3174	Landa Lake	Sag-2	2024-06-12	2	Palaemonetes sp.		2
3174	Landa Lake	Sag-2	2024-06-12	3	Ameiurus natalis	50	1
3174	Landa Lake	Sag-2	2024-06-12	3	Procambarus sp.		2
3174	Landa Lake	Sag-2	2024-06-12	4	Procambarus sp.		1
3174	Landa Lake	Sag-2	2024-06-12	4	Ameiurus natalis	28	1
3174	Landa Lake	Sag-2	2024-06-12	4	Palaemonetes sp.		1
3174	Landa Lake	Sag-2	2024-06-12	5	Procambarus sp.		1
3174	Landa Lake	Sag-2	2024-06-12	6	Etheostoma fonticola	29	1
3174	Landa Lake	Sag-2	2024-06-12	7	Procambarus sp.		7
3174	Landa Lake	Sag-2	2024-06-12	7	Lepomis miniatus	45	1
3174	Landa Lake	Sag-2	2024-06-12	7	Etheostoma fonticola	32	1
3174	Landa Lake	Sag-2	2024-06-12	7	Etheostoma fonticola	12	1
3174	Landa Lake	Sag-2	2024-06-12	7	Palaemonetes sp.		1
3174	Landa Lake	Sag-2	2024-06-12	8	Procambarus sp.		2
3174	Landa Lake	Sag-2	2024-06-12	9	Procambarus sp.		1
3174	Landa Lake	Sag-2	2024-06-12	9	Ameiurus natalis	56	1
3174	Landa Lake	Sag-2	2024-06-12	10	Procambarus sp.		1
3174	Landa Lake	Sag-2	2024-06-12	10	Etheostoma fonticola	29	1
3174	Landa Lake	Sag-2	2024-06-12	11	Procambarus sp.		2
3174	Landa Lake	Sag-2	2024-06-12	11	Palaemonetes sp.		1
3174	Landa Lake	Sag-2	2024-06-12	12	Procambarus sp.		1

3174	Landa Lake	Sag-2	2024-06-12	13	Procambarus sp.		1
3174	Landa Lake	Sag-2	2024-06-12	14	Procambarus sp.		1
3174	Landa Lake	Sag-2	2024-06-12	15	No fish collected		
3175	Landa Lake	Lud-1	2024-06-12	1	Palaemonetes sp.		30
3175	Landa Lake	Lud-1	2024-06-12	1	Procambarus sp.		2
3175	Landa Lake	Lud-1	2024-06-12	1	Dionda nigrotaeniata	40	1
3175	Landa Lake	Lud-1	2024-06-12	1	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	1	Etheostoma fonticola	27	1
3175	Landa Lake	Lud-1	2024-06-12	1	Etheostoma fonticola	20	1
3175	Landa Lake	Lud-1	2024-06-12	1	Etheostoma fonticola	26	1
3175	Landa Lake	Lud-1	2024-06-12	1	Etheostoma fonticola	15	1
3175	Landa Lake	Lud-1	2024-06-12	1	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	1	Etheostoma fonticola	12	1
3175	Landa Lake	Lud-1	2024-06-12	1	Etheostoma fonticola	20	1
3175	Landa Lake	Lud-1	2024-06-12	1	Gambusia sp.	10	1
3175	Landa Lake	Lud-1	2024-06-12	1	Gambusia sp.	12	1
3175	Landa Lake	Lud-1	2024-06-12	2	Palaemonetes sp.		19
3175	Landa Lake	Lud-1	2024-06-12	2	Procambarus sp.		1
3175	Landa Lake	Lud-1	2024-06-12	2	Etheostoma fonticola	17	1
3175	Landa Lake	Lud-1	2024-06-12	2	Etheostoma fonticola	15	1
3175	Landa Lake	Lud-1	2024-06-12	2	Etheostoma fonticola	20	1
3175	Landa Lake	Lud-1	2024-06-12	2	Etheostoma fonticola	27	1
3175	Landa Lake	Lud-1	2024-06-12	2	Etheostoma fonticola	14	1
3175	Landa Lake	Lud-1	2024-06-12	2	Dionda nigrotaeniata	30	1
3175	Landa Lake	Lud-1	2024-06-12	3	Procambarus sp.		3
3175	Landa Lake	Lud-1	2024-06-12	3	Palaemonetes sp.		9
3175	Landa Lake	Lud-1	2024-06-12	3	Etheostoma fonticola	26	1
3175	Landa Lake	Lud-1	2024-06-12	3	Etheostoma fonticola	27	1
3175	Landa Lake	Lud-1	2024-06-12	3	Etheostoma fonticola	22	1
3175	Landa Lake	Lud-1	2024-06-12	3	Etheostoma fonticola	21	1

3175	Landa Lake	Lud-1	2024-06-12	3	Gambusia sp.	14	1
3175	Landa Lake	Lud-1	2024-06-12	3	Gambusia sp.	10	1
3175	Landa Lake	Lud-1	2024-06-12	3	Lepomis miniatus	31	1
3175	Landa Lake	Lud-1	2024-06-12	4	Procambarus sp.		2
3175	Landa Lake	Lud-1	2024-06-12	4	Etheostoma fonticola	25	1
3175	Landa Lake	Lud-1	2024-06-12	4	Etheostoma fonticola	19	1
3175	Landa Lake	Lud-1	2024-06-12	4	Etheostoma fonticola	20	1
3175	Landa Lake	Lud-1	2024-06-12	4	Palaemonetes sp.		2
3175	Landa Lake	Lud-1	2024-06-12	5	Procambarus sp.		8
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	25	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	26	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	19	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	21	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	29	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	31	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	23	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	27	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	23	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	23	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	24	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	24	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	27	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	19	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	16	1
3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	15	1

3175	Landa Lake	Lud-1	2024-06-12	5	Etheostoma fonticola	16	1
3175	Landa Lake	Lud-1	2024-06-12	5	Palaemonetes sp.		4
3175	Landa Lake	Lud-1	2024-06-12	6	Procambarus sp.		10
3175	Landa Lake	Lud-1	2024-06-12	6	Palaemonetes sp.		4
3175	Landa Lake	Lud-1	2024-06-12	6	Etheostoma fonticola	26	1
3175	Landa Lake	Lud-1	2024-06-12	6	Etheostoma fonticola	22	1
3175	Landa Lake	Lud-1	2024-06-12	6	Etheostoma fonticola	23	1
3175	Landa Lake	Lud-1	2024-06-12	6	Etheostoma fonticola	23	1
3175	Landa Lake	Lud-1	2024-06-12	6	Etheostoma fonticola	22	1
3175	Landa Lake	Lud-1	2024-06-12	6	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	6	Etheostoma fonticola	9	1
3175	Landa Lake	Lud-1	2024-06-12	6	Etheostoma fonticola	20	1
3175	Landa Lake	Lud-1	2024-06-12	6	Ameiurus natalis	14	1
3175	Landa Lake	Lud-1	2024-06-12	6	Ameiurus natalis	12	1
3175	Landa Lake	Lud-1	2024-06-12	7	Procambarus sp.		4
3175	Landa Lake	Lud-1	2024-06-12	7	Etheostoma fonticola	20	1
3175	Landa Lake	Lud-1	2024-06-12	7	Etheostoma fonticola	25	1
3175	Landa Lake	Lud-1	2024-06-12	7	Etheostoma fonticola	23	1
3175	Landa Lake	Lud-1	2024-06-12	7	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	7	Etheostoma fonticola	27	1
3175	Landa Lake	Lud-1	2024-06-12	7	Etheostoma fonticola	25	1
3175	Landa Lake	Lud-1	2024-06-12	7	Gambusia sp.	12	1
3175	Landa Lake	Lud-1	2024-06-12	8	Procambarus sp.		3
3175	Landa Lake	Lud-1	2024-06-12	8	Etheostoma fonticola	27	1
3175	Landa Lake	Lud-1	2024-06-12	8	Etheostoma fonticola	22	1
3175	Landa Lake	Lud-1	2024-06-12	8	Palaemonetes sp.		1
3175	Landa Lake	Lud-1	2024-06-12	9	Procambarus sp.		13
3175	Landa Lake	Lud-1	2024-06-12	9	Palaemonetes sp.		1
3175	Landa Lake	Lud-1	2024-06-12	9	Etheostoma fonticola	32	1
3175	Landa Lake	Lud-1	2024-06-12	9	Etheostoma fonticola	25	1

3175	Landa Lake	Lud-1	2024-06-12	9	Etheostoma fonticola	32	1
3175	Landa Lake	Lud-1	2024-06-12	9	Etheostoma fonticola	29	1
3175	Landa Lake	Lud-1	2024-06-12	9	Etheostoma fonticola	24	1
3175	Landa Lake	Lud-1	2024-06-12	9	Etheostoma fonticola	22	1
3175	Landa Lake	Lud-1	2024-06-12	10	Procambarus sp.		3
3175	Landa Lake	Lud-1	2024-06-12	10	Palaemonetes sp.		2
3175	Landa Lake	Lud-1	2024-06-12	10	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	10	Etheostoma fonticola	25	1
3175	Landa Lake	Lud-1	2024-06-12	10	Etheostoma fonticola	25	1
3175	Landa Lake	Lud-1	2024-06-12	10	Etheostoma fonticola	23	1
3175	Landa Lake	Lud-1	2024-06-12	10	Etheostoma fonticola	22	1
3175	Landa Lake	Lud-1	2024-06-12	11	Procambarus sp.		7
3175	Landa Lake	Lud-1	2024-06-12	11	Palaemonetes sp.		1
3175	Landa Lake	Lud-1	2024-06-12	11	Etheostoma fonticola	23	1
3175	Landa Lake	Lud-1	2024-06-12	11	Etheostoma fonticola	22	1
3175	Landa Lake	Lud-1	2024-06-12	11	Etheostoma fonticola	32	1
3175	Landa Lake	Lud-1	2024-06-12	11	Etheostoma fonticola	32	1
3175	Landa Lake	Lud-1	2024-06-12	11	Etheostoma fonticola	27	1
3175	Landa Lake	Lud-1	2024-06-12	11	Etheostoma fonticola	26	1
3175	Landa Lake	Lud-1	2024-06-12	11	Etheostoma fonticola	26	1
3175	Landa Lake	Lud-1	2024-06-12	11	Etheostoma fonticola	24	1
3175	Landa Lake	Lud-1	2024-06-12	11	Etheostoma fonticola	26	1
3175	Landa Lake	Lud-1	2024-06-12	11	Etheostoma fonticola	25	1
3175	Landa Lake	Lud-1	2024-06-12	12	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	12	Etheostoma fonticola	19	1
3175	Landa Lake	Lud-1	2024-06-12	12	Etheostoma fonticola	24	1
3175	Landa Lake	Lud-1	2024-06-12	12	Etheostoma fonticola	24	1
3175	Landa Lake	Lud-1	2024-06-12	12	Etheostoma fonticola	18	1
3175	Landa Lake	Lud-1	2024-06-12	12	Etheostoma fonticola	25	1
3175	Landa Lake	Lud-1	2024-06-12	12	Etheostoma fonticola	28	1

3175	Landa Lake	Lud-1	2024-06-12	12	Etheostoma fonticola	22	1
3175	Landa Lake	Lud-1	2024-06-12	12	Etheostoma fonticola	26	1
3175	Landa Lake	Lud-1	2024-06-12	12	Etheostoma fonticola	25	1
3175	Landa Lake	Lud-1	2024-06-12	12	Procambarus sp.		1
3175	Landa Lake	Lud-1	2024-06-12	13	Procambarus sp.		3
3175	Landa Lake	Lud-1	2024-06-12	13	Etheostoma fonticola	25	1
3175	Landa Lake	Lud-1	2024-06-12	13	Etheostoma fonticola	25	1
3175	Landa Lake	Lud-1	2024-06-12	13	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	13	Etheostoma fonticola	27	1
3175	Landa Lake	Lud-1	2024-06-12	13	Etheostoma fonticola	32	1
3175	Landa Lake	Lud-1	2024-06-12	13	Etheostoma fonticola	26	1
3175	Landa Lake	Lud-1	2024-06-12	14	Procambarus sp.		1
3175	Landa Lake	Lud-1	2024-06-12	14	Etheostoma fonticola	32	1
3175	Landa Lake	Lud-1	2024-06-12	14	Etheostoma fonticola	30	1
3175	Landa Lake	Lud-1	2024-06-12	14	Etheostoma fonticola	17	1
3175	Landa Lake	Lud-1	2024-06-12	14	Lepomis miniatus	45	1
3175	Landa Lake	Lud-1	2024-06-12	15	Palaemonetes sp.		2
3175	Landa Lake	Lud-1	2024-06-12	15	Procambarus sp.		2
3175	Landa Lake	Lud-1	2024-06-12	15	Etheostoma fonticola	21	1
3175	Landa Lake	Lud-1	2024-06-12	16	Etheostoma fonticola	17	1
3175	Landa Lake	Lud-1	2024-06-12	16	Etheostoma fonticola	25	1
3175	Landa Lake	Lud-1	2024-06-12	16	Etheostoma fonticola	20	1
3175	Landa Lake	Lud-1	2024-06-12	16	Procambarus sp.		3
3175	Landa Lake	Lud-1	2024-06-12	16	Palaemonetes sp.		1
3175	Landa Lake	Lud-1	2024-06-12	16	Gambusia sp.	10	1
3175	Landa Lake	Lud-1	2024-06-12	17	Palaemonetes sp.		1
3175	Landa Lake	Lud-1	2024-06-12	17	Etheostoma fonticola	24	1
3175	Landa Lake	Lud-1	2024-06-12	17	Etheostoma fonticola	19	1
3175	Landa Lake	Lud-1	2024-06-12	17	Etheostoma fonticola	26	1
3175	Landa Lake	Lud-1	2024-06-12	17	Etheostoma fonticola	28	1

3175	Landa Lake	Lud-1	2024-06-12	17	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	17	Etheostoma fonticola	25	1
3175	Landa Lake	Lud-1	2024-06-12	18	Procambarus sp.		1
3175	Landa Lake	Lud-1	2024-06-12	18	Etheostoma fonticola	25	1
3175	Landa Lake	Lud-1	2024-06-12	18	Etheostoma fonticola	26	1
3175	Landa Lake	Lud-1	2024-06-12	19	Procambarus sp.		2
3175	Landa Lake	Lud-1	2024-06-12	19	Etheostoma fonticola	20	1
3175	Landa Lake	Lud-1	2024-06-12	19	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	19	Etheostoma fonticola	12	1
3175	Landa Lake	Lud-1	2024-06-12	19	Etheostoma fonticola	15	1
3175	Landa Lake	Lud-1	2024-06-12	20	Procambarus sp.		1
3175	Landa Lake	Lud-1	2024-06-12	20	Etheostoma fonticola	15	1
3175	Landa Lake	Lud-1	2024-06-12	20	Etheostoma fonticola	28	1
3175	Landa Lake	Lud-1	2024-06-12	21	Procambarus sp.		1
3175	Landa Lake	Lud-1	2024-06-12	21	Etheostoma fonticola	19	1
3175	Landa Lake	Lud-1	2024-06-12	22	Etheostoma fonticola	20	1
3175	Landa Lake	Lud-1	2024-06-12	22	Etheostoma fonticola	32	1
3175	Landa Lake	Lud-1	2024-06-12	23	Procambarus sp.		1
3175	Landa Lake	Lud-1	2024-06-12	23	Etheostoma fonticola	22	1
3175	Landa Lake	Lud-1	2024-06-12	24	Procambarus sp.		1
3175	Landa Lake	Lud-1	2024-06-12	24	Palaemonetes sp.		1
3176	Landa Lake	Cab-1	2024-06-12	1	Etheostoma fonticola	23	1
3176	Landa Lake	Cab-1	2024-06-12	1	Etheostoma fonticola	19	1
3176	Landa Lake	Cab-1	2024-06-12	1	Etheostoma fonticola	18	1
3176	Landa Lake	Cab-1	2024-06-12	1	Etheostoma fonticola	18	1
3176	Landa Lake	Cab-1	2024-06-12	1	Etheostoma fonticola	16	1
3176	Landa Lake	Cab-1	2024-06-12	1	Etheostoma fonticola	25	1
3176	Landa Lake	Cab-1	2024-06-12	1	Etheostoma fonticola	20	1
3176	Landa Lake	Cab-1	2024-06-12	1	Etheostoma fonticola	19	1
3176	Landa Lake	Cab-1	2024-06-12	2	Etheostoma fonticola	24	1

3176	Landa Lake	Cab-1	2024-06-12	2	Etheostoma fonticola	19	1
3176	Landa Lake	Cab-1	2024-06-12	3	Etheostoma fonticola	27	1
3176	Landa Lake	Cab-1	2024-06-12	3	Etheostoma fonticola	18	1
3176	Landa Lake	Cab-1	2024-06-12	3	Etheostoma fonticola	14	1
3176	Landa Lake	Cab-1	2024-06-12	3	Etheostoma fonticola	22	1
3176	Landa Lake	Cab-1	2024-06-12	3	Etheostoma fonticola	18	1
3176	Landa Lake	Cab-1	2024-06-12	3	Etheostoma fonticola	18	1
3176	Landa Lake	Cab-1	2024-06-12	4	Etheostoma fonticola	16	1
3176	Landa Lake	Cab-1	2024-06-12	4	Etheostoma fonticola	18	1
3176	Landa Lake	Cab-1	2024-06-12	5	Etheostoma fonticola	29	1
3176	Landa Lake	Cab-1	2024-06-12	5	Etheostoma fonticola	21	1
3176	Landa Lake	Cab-1	2024-06-12	5	Etheostoma fonticola	28	1
3176	Landa Lake	Cab-1	2024-06-12	5	Etheostoma fonticola	22	1
3176	Landa Lake	Cab-1	2024-06-12	5	Etheostoma fonticola	27	1
3176	Landa Lake	Cab-1	2024-06-12	6	Etheostoma fonticola	22	1
3176	Landa Lake	Cab-1	2024-06-12	7	No fish collected		
3176	Landa Lake	Cab-1	2024-06-12	8	Procambarus sp.		1
3176	Landa Lake	Cab-1	2024-06-12	8	Etheostoma fonticola	28	1
3176	Landa Lake	Cab-1	2024-06-12	8	Etheostoma fonticola	24	1
3176	Landa Lake	Cab-1	2024-06-12	8	Etheostoma fonticola	20	1
3176	Landa Lake	Cab-1	2024-06-12	8	Etheostoma fonticola	17	1
3176	Landa Lake	Cab-1	2024-06-12	8	Etheostoma fonticola	19	1
3176	Landa Lake	Cab-1	2024-06-12	8	Etheostoma fonticola	28	1
3176	Landa Lake	Cab-1	2024-06-12	9	No fish collected		
3176	Landa Lake	Cab-1	2024-06-12	10	Etheostoma fonticola	15	1
3176	Landa Lake	Cab-1	2024-06-12	11	Procambarus sp.		1
3176	Landa Lake	Cab-1	2024-06-12	12	Etheostoma fonticola	26	1
3176	Landa Lake	Cab-1	2024-06-12	12	Etheostoma fonticola	26	1
3176	Landa Lake	Cab-1	2024-06-12	13	Etheostoma fonticola	19	1
3176	Landa Lake	Cab-1	2024-06-12	14	Procambarus sp.		1

3176	Landa Lake	Cab-1	2024-06-12	15	No fish collected		
3177	Landa Lake	Cab-2	2024-06-12	1	Etheostoma fonticola	18	1
3177	Landa Lake	Cab-2	2024-06-12	1	Etheostoma fonticola	20	1
3177	Landa Lake	Cab-2	2024-06-12	1	Etheostoma fonticola	18	1
3177	Landa Lake	Cab-2	2024-06-12	1	Etheostoma fonticola	19	1
3177	Landa Lake	Cab-2	2024-06-12	1	Etheostoma fonticola	21	1
3177	Landa Lake	Cab-2	2024-06-12	1	Etheostoma fonticola	17	1
3177	Landa Lake	Cab-2	2024-06-12	2	Etheostoma fonticola	31	1
3177	Landa Lake	Cab-2	2024-06-12	2	Etheostoma fonticola	22	1
3177	Landa Lake	Cab-2	2024-06-12	2	Etheostoma fonticola	22	1
3177	Landa Lake	Cab-2	2024-06-12	2	Etheostoma fonticola	19	1
3177	Landa Lake	Cab-2	2024-06-12	2	Etheostoma fonticola	21	1
3177	Landa Lake	Cab-2	2024-06-12	2	Etheostoma fonticola	17	1
3177	Landa Lake	Cab-2	2024-06-12	2	Etheostoma fonticola	26	1
3177	Landa Lake	Cab-2	2024-06-12	2	Etheostoma fonticola	18	1
3177	Landa Lake	Cab-2	2024-06-12	2	Procambarus sp.		1
3177	Landa Lake	Cab-2	2024-06-12	3	Etheostoma fonticola	28	1
3177	Landa Lake	Cab-2	2024-06-12	3	Etheostoma fonticola	20	1
3177	Landa Lake	Cab-2	2024-06-12	3	Etheostoma fonticola	30	1
3177	Landa Lake	Cab-2	2024-06-12	3	Etheostoma fonticola	18	1
3177	Landa Lake	Cab-2	2024-06-12	3	Etheostoma fonticola	19	1
3177	Landa Lake	Cab-2	2024-06-12	3	Etheostoma fonticola	20	1
3177	Landa Lake	Cab-2	2024-06-12	3	Etheostoma fonticola	17	1
3177	Landa Lake	Cab-2	2024-06-12	3	Gambusia sp.	8	1
3177	Landa Lake	Cab-2	2024-06-12	3	Procambarus sp.		3
3177	Landa Lake	Cab-2	2024-06-12	4	Etheostoma fonticola	23	1
3177	Landa Lake	Cab-2	2024-06-12	4	Etheostoma fonticola	19	1
3177	Landa Lake	Cab-2	2024-06-12	4	Procambarus sp.		2
3177	Landa Lake	Cab-2	2024-06-12	5	Etheostoma fonticola	24	1
3177	Landa Lake	Cab-2	2024-06-12	5	Etheostoma fonticola	29	1

3177	Landa Lake	Cab-2	2024-06-12	5	Etheostoma fonticola	22	1
3177	Landa Lake	Cab-2	2024-06-12	5	Lepomis miniatus	45	1
3177	Landa Lake	Cab-2	2024-06-12	5	Lepomis sp.	8	1
3177	Landa Lake	Cab-2	2024-06-12	5	Procambarus sp.		1
3177	Landa Lake	Cab-2	2024-06-12	6	Procambarus sp.		5
3177	Landa Lake	Cab-2	2024-06-12	6	Etheostoma fonticola	24	1
3177	Landa Lake	Cab-2	2024-06-12	6	Etheostoma fonticola	29	1
3177	Landa Lake	Cab-2	2024-06-12	6	Etheostoma fonticola	28	1
3177	Landa Lake	Cab-2	2024-06-12	7	Etheostoma fonticola	22	1
3177	Landa Lake	Cab-2	2024-06-12	7	Etheostoma fonticola	33	1
3177	Landa Lake	Cab-2	2024-06-12	8	Etheostoma fonticola	18	1
3177	Landa Lake	Cab-2	2024-06-12	8	Procambarus sp.		1
3177	Landa Lake	Cab-2	2024-06-12	9	Etheostoma fonticola	19	1
3177	Landa Lake	Cab-2	2024-06-12	9	Etheostoma fonticola	20	1
3177	Landa Lake	Cab-2	2024-06-12	9	Etheostoma fonticola	19	1
3177	Landa Lake	Cab-2	2024-06-12	9	Etheostoma fonticola	28	1
3177	Landa Lake	Cab-2	2024-06-12	9	Etheostoma fonticola	16	1
3177	Landa Lake	Cab-2	2024-06-12	9	Etheostoma fonticola	28	1
3177	Landa Lake	Cab-2	2024-06-12	9	Lepomis miniatus	45	1
3177	Landa Lake	Cab-2	2024-06-12	10	Etheostoma fonticola	18	1
3177	Landa Lake	Cab-2	2024-06-12	10	Etheostoma fonticola	27	1
3177	Landa Lake	Cab-2	2024-06-12	10	Etheostoma fonticola	15	1
3177	Landa Lake	Cab-2	2024-06-12	10	Procambarus sp.		1
3177	Landa Lake	Cab-2	2024-06-12	11	No fish collected		
3177	Landa Lake	Cab-2	2024-06-12	12	Procambarus sp.		2
3177	Landa Lake	Cab-2	2024-06-12	12	Etheostoma fonticola	19	1
3177	Landa Lake	Cab-2	2024-06-12	13	Etheostoma fonticola	33	1
3177	Landa Lake	Cab-2	2024-06-12	13	Etheostoma fonticola	16	1
3177	Landa Lake	Cab-2	2024-06-12	13	Etheostoma fonticola	19	1
3177	Landa Lake	Cab-2	2024-06-12	14	Etheostoma fonticola	22	1

3177	Landa Lake	Cab-2	2024-06-12	14	Etheostoma fonticola	22	1
3177	Landa Lake	Cab-2	2024-06-12	15	Procambarus sp.		1
3178	Landa Lake	Lud-2	2024-06-12	1	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	1	Etheostoma fonticola	27	1
3178	Landa Lake	Lud-2	2024-06-12	1	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	1	Etheostoma fonticola	22	1
3178	Landa Lake	Lud-2	2024-06-12	1	Etheostoma fonticola	30	1
3178	Landa Lake	Lud-2	2024-06-12	1	Procambarus sp.		7
3178	Landa Lake	Lud-2	2024-06-12	1	Palaemonetes sp.		7
3178	Landa Lake	Lud-2	2024-06-12	1	Gambusia sp.	8	1
3178	Landa Lake	Lud-2	2024-06-12	1	Gambusia sp.	10	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	23	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	24	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	23	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	28	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	27	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	21	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	31	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	28	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	28	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	24	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	32	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	18	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	23	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	27	1

3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	29	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	34	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	26	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	28	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	22	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	24	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	18	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	21	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	22	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	29	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	20	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	15	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	28	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	20	1
3178	Landa Lake	Lud-2	2024-06-12	2	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	2	Procambarus sp.		38
3178	Landa Lake	Lud-2	2024-06-12	2	Palaemonetes sp.		6
3178	Landa Lake	Lud-2	2024-06-12	2	Gambusia sp.	15	1
3178	Landa Lake	Lud-2	2024-06-12	2	Gambusia sp.	13	1
3178	Landa Lake	Lud-2	2024-06-12	3	Procambarus sp.		16
3178	Landa Lake	Lud-2	2024-06-12	3	Palaemonetes sp.		5
3178	Landa Lake	Lud-2	2024-06-12	3	Etheostoma fonticola	26	1
3178	Landa Lake	Lud-2	2024-06-12	3	Etheostoma fonticola	31	1
3178	Landa Lake	Lud-2	2024-06-12	3	Etheostoma fonticola	19	1
3178	Landa Lake	Lud-2	2024-06-12	3	Etheostoma fonticola	22	1
3178	Landa Lake	Lud-2	2024-06-12	3	Etheostoma fonticola	24	1
3178	Landa Lake	Lud-2	2024-06-12	3	Etheostoma fonticola	28	1
3178	Landa Lake	Lud-2	2024-06-12	3	Etheostoma fonticola	19	1

3178	Landa Lake	Lud-2	2024-06-12	4	Procambarus sp.		3
3178	Landa Lake	Lud-2	2024-06-12	4	Lepomis miniatus	39	1
3178	Landa Lake	Lud-2	2024-06-12	4	Etheostoma fonticola	20	1
3178	Landa Lake	Lud-2	2024-06-12	4	Etheostoma fonticola	30	1
3178	Landa Lake	Lud-2	2024-06-12	4	Etheostoma fonticola	30	1
3178	Landa Lake	Lud-2	2024-06-12	4	Etheostoma fonticola	26	1
3178	Landa Lake	Lud-2	2024-06-12	4	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	4	Etheostoma fonticola	30	1
3178	Landa Lake	Lud-2	2024-06-12	4	Etheostoma fonticola	24	1
3178	Landa Lake	Lud-2	2024-06-12	4	Etheostoma fonticola	26	1
3178	Landa Lake	Lud-2	2024-06-12	4	Etheostoma fonticola	24	1
3178	Landa Lake	Lud-2	2024-06-12	4	Etheostoma fonticola	21	1
3178	Landa Lake	Lud-2	2024-06-12	4	Etheostoma fonticola	28	1
3178	Landa Lake	Lud-2	2024-06-12	4	Etheostoma fonticola	31	1
3178	Landa Lake	Lud-2	2024-06-12	4	Etheostoma fonticola	28	1
3178	Landa Lake	Lud-2	2024-06-12	5	Lepomis miniatus	35	1
3178	Landa Lake	Lud-2	2024-06-12	5	Lepomis miniatus	45	1
3178	Landa Lake	Lud-2	2024-06-12	5	Etheostoma fonticola	29	1
3178	Landa Lake	Lud-2	2024-06-12	5	Etheostoma fonticola	22	1
3178	Landa Lake	Lud-2	2024-06-12	5	Etheostoma fonticola	29	1
3178	Landa Lake	Lud-2	2024-06-12	5	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	5	Etheostoma fonticola	24	1
3178	Landa Lake	Lud-2	2024-06-12	5	Etheostoma fonticola	29	1
3178	Landa Lake	Lud-2	2024-06-12	5	Etheostoma fonticola	26	1
3178	Landa Lake	Lud-2	2024-06-12	5	Etheostoma fonticola	28	1
3178	Landa Lake	Lud-2	2024-06-12	5	Etheostoma fonticola	22	1
3178	Landa Lake	Lud-2	2024-06-12	5	Etheostoma fonticola	16	1
3178	Landa Lake	Lud-2	2024-06-12	5	Procambarus sp.		4
3178	Landa Lake	Lud-2	2024-06-12	6	Etheostoma fonticola	33	1
3178	Landa Lake	Lud-2	2024-06-12	6	Etheostoma fonticola	32	1

3178	Landa Lake	Lud-2	2024-06-12	6	Etheostoma fonticola	27	1
3178	Landa Lake	Lud-2	2024-06-12	6	Etheostoma fonticola	30	1
3178	Landa Lake	Lud-2	2024-06-12	6	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	6	Etheostoma fonticola	31	1
3178	Landa Lake	Lud-2	2024-06-12	6	Procambarus sp.		8
3178	Landa Lake	Lud-2	2024-06-12	7	Lepomis miniatus	30	1
3178	Landa Lake	Lud-2	2024-06-12	7	Procambarus sp.		5
3178	Landa Lake	Lud-2	2024-06-12	7	Etheostoma fonticola	29	1
3178	Landa Lake	Lud-2	2024-06-12	7	Etheostoma fonticola	26	1
3178	Landa Lake	Lud-2	2024-06-12	7	Etheostoma fonticola	28	1
3178	Landa Lake	Lud-2	2024-06-12	8	Gambusia sp.	12	1
3178	Landa Lake	Lud-2	2024-06-12	8	Etheostoma fonticola	27	1
3178	Landa Lake	Lud-2	2024-06-12	8	Etheostoma fonticola	26	1
3178	Landa Lake	Lud-2	2024-06-12	8	Etheostoma fonticola	31	1
3178	Landa Lake	Lud-2	2024-06-12	8	Palaemonetes sp.		1
3178	Landa Lake	Lud-2	2024-06-12	8	Procambarus sp.		1
3178	Landa Lake	Lud-2	2024-06-12	9	Procambarus sp.		19
3178	Landa Lake	Lud-2	2024-06-12	9	Etheostoma fonticola	28	1
3178	Landa Lake	Lud-2	2024-06-12	9	Etheostoma fonticola	32	1
3178	Landa Lake	Lud-2	2024-06-12	9	Etheostoma fonticola	15	1
3178	Landa Lake	Lud-2	2024-06-12	9	Etheostoma fonticola	27	1
3178	Landa Lake	Lud-2	2024-06-12	9	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	9	Etheostoma fonticola	17	1
3178	Landa Lake	Lud-2	2024-06-12	9	Etheostoma fonticola	20	1
3178	Landa Lake	Lud-2	2024-06-12	9	Etheostoma fonticola	27	1
3178	Landa Lake	Lud-2	2024-06-12	9	Etheostoma fonticola	26	1
3178	Landa Lake	Lud-2	2024-06-12	10	Etheostoma fonticola	31	1
3178	Landa Lake	Lud-2	2024-06-12	10	Etheostoma fonticola	29	1
3178	Landa Lake	Lud-2	2024-06-12	10	Etheostoma fonticola	29	1
3178	Landa Lake	Lud-2	2024-06-12	10	Etheostoma fonticola	30	1

3178	Landa Lake	Lud-2	2024-06-12	10	Etheostoma fonticola	30	1
3178	Landa Lake	Lud-2	2024-06-12	10	Etheostoma fonticola	27	1
3178	Landa Lake	Lud-2	2024-06-12	10	Palaemonetes sp.		1
3178	Landa Lake	Lud-2	2024-06-12	10	Procambarus sp.		12
3178	Landa Lake	Lud-2	2024-06-12	11	Etheostoma fonticola	30	1
3178	Landa Lake	Lud-2	2024-06-12	11	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	11	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	11	Etheostoma fonticola	17	1
3178	Landa Lake	Lud-2	2024-06-12	11	Lepomis miniatus	35	1
3178	Landa Lake	Lud-2	2024-06-12	11	Procambarus sp.		2
3178	Landa Lake	Lud-2	2024-06-12	12	Etheostoma fonticola	27	1
3178	Landa Lake	Lud-2	2024-06-12	12	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	12	Etheostoma fonticola	23	1
3178	Landa Lake	Lud-2	2024-06-12	12	Procambarus sp.		5
3178	Landa Lake	Lud-2	2024-06-12	13	Procambarus sp.		3
3178	Landa Lake	Lud-2	2024-06-12	13	Etheostoma fonticola	28	1
3178	Landa Lake	Lud-2	2024-06-12	13	Etheostoma fonticola	26	1
3178	Landa Lake	Lud-2	2024-06-12	14	Procambarus sp.		2
3178	Landa Lake	Lud-2	2024-06-12	14	Etheostoma fonticola	32	1
3178	Landa Lake	Lud-2	2024-06-12	14	Etheostoma fonticola	28	1
3178	Landa Lake	Lud-2	2024-06-12	14	Etheostoma fonticola	28	1
3178	Landa Lake	Lud-2	2024-06-12	14	Etheostoma fonticola	27	1
3178	Landa Lake	Lud-2	2024-06-12	15	Etheostoma fonticola	35	1
3178	Landa Lake	Lud-2	2024-06-12	15	Etheostoma fonticola	31	1
3178	Landa Lake	Lud-2	2024-06-12	16	Etheostoma fonticola	26	1
3178	Landa Lake	Lud-2	2024-06-12	16	Etheostoma fonticola	25	1
3178	Landa Lake	Lud-2	2024-06-12	16	Etheostoma fonticola	30	1
3178	Landa Lake	Lud-2	2024-06-12	16	Procambarus sp.		1
3178	Landa Lake	Lud-2	2024-06-12	17	Procambarus sp.		1
3179	Landa Lake	Bryo-1	2024-06-12	1	Etheostoma fonticola	33	1

3179	Landa Lake	Bryo-1	2024-06-12	1	Etheostoma fonticola	25	1
3179	Landa Lake	Bryo-1	2024-06-12	1	Etheostoma fonticola	36	1
3179	Landa Lake	Bryo-1	2024-06-12	1	Etheostoma fonticola	9	1
3179	Landa Lake	Bryo-1	2024-06-12	1	Etheostoma fonticola	34	1
3179	Landa Lake	Bryo-1	2024-06-12	1	Etheostoma fonticola	33	1
3179	Landa Lake	Bryo-1	2024-06-12	1	Etheostoma fonticola	23	1
3179	Landa Lake	Bryo-1	2024-06-12	1	Etheostoma fonticola	20	1
3179	Landa Lake	Bryo-1	2024-06-12	1	Etheostoma fonticola	32	1
3179	Landa Lake	Bryo-1	2024-06-12	1	Etheostoma fonticola	26	1
3179	Landa Lake	Bryo-1	2024-06-12	1	Etheostoma fonticola	20	1
3179	Landa Lake	Bryo-1	2024-06-12	1	Palaemonetes sp.		14
3179	Landa Lake	Bryo-1	2024-06-12	1	Procambarus sp.		1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	29	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	25	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	24	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	28	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	30	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	30	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	28	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	20	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	22	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	28	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	30	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	34	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	26	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	28	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Etheostoma fonticola	27	1
3179	Landa Lake	Bryo-1	2024-06-12	2	Palaemonetes sp.		14
3179	Landa Lake	Bryo-1	2024-06-12	3	Palaemonetes sp.		4
3179	Landa Lake	Bryo-1	2024-06-12	3	Etheostoma fonticola	29	1

3179	Landa Lake	Bryo-1	2024-06-12	3	Etheostoma fonticola	28	1
3179	Landa Lake	Bryo-1	2024-06-12	3	Etheostoma fonticola	25	1
3179	Landa Lake	Bryo-1	2024-06-12	3	Etheostoma fonticola	28	1
3179	Landa Lake	Bryo-1	2024-06-12	3	Etheostoma fonticola	30	1
3179	Landa Lake	Bryo-1	2024-06-12	3	Etheostoma fonticola	20	1
3179	Landa Lake	Bryo-1	2024-06-12	3	Etheostoma fonticola	31	1
3179	Landa Lake	Bryo-1	2024-06-12	3	Etheostoma fonticola	10	1
3179	Landa Lake	Bryo-1	2024-06-12	3	Etheostoma fonticola	23	1
3179	Landa Lake	Bryo-1	2024-06-12	4	Palaemonetes sp.		1
3179	Landa Lake	Bryo-1	2024-06-12	4	Etheostoma fonticola	32	1
3179	Landa Lake	Bryo-1	2024-06-12	4	Etheostoma fonticola	24	1
3179	Landa Lake	Bryo-1	2024-06-12	4	Etheostoma fonticola	25	1
3179	Landa Lake	Bryo-1	2024-06-12	4	Etheostoma fonticola	26	1
3179	Landa Lake	Bryo-1	2024-06-12	4	Etheostoma fonticola	28	1
3179	Landa Lake	Bryo-1	2024-06-12	4	Etheostoma fonticola	28	1
3179	Landa Lake	Bryo-1	2024-06-12	4	Etheostoma fonticola	18	1
3179	Landa Lake	Bryo-1	2024-06-12	5	Palaemonetes sp.		2
3179	Landa Lake	Bryo-1	2024-06-12	5	Etheostoma fonticola	30	1
3179	Landa Lake	Bryo-1	2024-06-12	5	Etheostoma fonticola	24	1
3179	Landa Lake	Bryo-1	2024-06-12	5	Etheostoma fonticola	31	1
3179	Landa Lake	Bryo-1	2024-06-12	5	Etheostoma fonticola	35	1
3179	Landa Lake	Bryo-1	2024-06-12	5	Etheostoma fonticola	16	1
3179	Landa Lake	Bryo-1	2024-06-12	6	Etheostoma fonticola	32	1
3179	Landa Lake	Bryo-1	2024-06-12	6	Etheostoma fonticola	28	1
3179	Landa Lake	Bryo-1	2024-06-12	6	Etheostoma fonticola	25	1
3179	Landa Lake	Bryo-1	2024-06-12	6	Procambarus sp.		1
3179	Landa Lake	Bryo-1	2024-06-12	6	Palaemonetes sp.		1
3179	Landa Lake	Bryo-1	2024-06-12	7	Etheostoma fonticola	27	1
3179	Landa Lake	Bryo-1	2024-06-12	7	Etheostoma fonticola	29	1
3179	Landa Lake	Bryo-1	2024-06-12	7	Etheostoma fonticola	32	1

3179	Landa Lake	Bryo-1	2024-06-12	7	Etheostoma fonticola	30	1
3179	Landa Lake	Bryo-1	2024-06-12	7	Palaemonetes sp.		2
3179	Landa Lake	Bryo-1	2024-06-12	7	Procambarus sp.		1
3179	Landa Lake	Bryo-1	2024-06-12	8	Etheostoma fonticola	14	1
3179	Landa Lake	Bryo-1	2024-06-12	9	Etheostoma fonticola	25	1
3179	Landa Lake	Bryo-1	2024-06-12	9	Etheostoma fonticola	23	1
3179	Landa Lake	Bryo-1	2024-06-12	9	Etheostoma fonticola	28	1
3179	Landa Lake	Bryo-1	2024-06-12	9	Etheostoma fonticola	14	1
3179	Landa Lake	Bryo-1	2024-06-12	10	Etheostoma fonticola	31	1
3179	Landa Lake	Bryo-1	2024-06-12	10	Etheostoma fonticola	29	1
3179	Landa Lake	Bryo-1	2024-06-12	11	Etheostoma fonticola	17	1
3179	Landa Lake	Bryo-1	2024-06-12	11	Etheostoma fonticola	26	1
3179	Landa Lake	Bryo-1	2024-06-12	11	Etheostoma fonticola	21	1
3179	Landa Lake	Bryo-1	2024-06-12	11	Etheostoma fonticola	28	1
3179	Landa Lake	Bryo-1	2024-06-12	11	Palaemonetes sp.		1
3179	Landa Lake	Bryo-1	2024-06-12	12	Etheostoma fonticola	21	1
3179	Landa Lake	Bryo-1	2024-06-12	12	Etheostoma fonticola	30	1
3179	Landa Lake	Bryo-1	2024-06-12	12	Etheostoma fonticola	29	1
3179	Landa Lake	Bryo-1	2024-06-12	12	Etheostoma fonticola	30	1
3179	Landa Lake	Bryo-1	2024-06-12	12	Etheostoma fonticola	23	1
3179	Landa Lake	Bryo-1	2024-06-12	13	Etheostoma fonticola	31	1
3179	Landa Lake	Bryo-1	2024-06-12	13	Etheostoma fonticola	35	1
3179	Landa Lake	Bryo-1	2024-06-12	14	Etheostoma fonticola	28	1
3179	Landa Lake	Bryo-1	2024-06-12	14	Etheostoma fonticola	28	1
3179	Landa Lake	Bryo-1	2024-06-12	15	Palaemonetes sp.		1
3179	Landa Lake	Bryo-1	2024-06-12	15	Etheostoma fonticola	35	1
3179	Landa Lake	Bryo-1	2024-06-12	16	Etheostoma fonticola	29	1
3179	Landa Lake	Bryo-1	2024-06-12	17	Etheostoma fonticola	26	1
3179	Landa Lake	Bryo-1	2024-06-12	18	Etheostoma fonticola	27	1
3179	Landa Lake	Bryo-1	2024-06-12	18	Etheostoma fonticola	27	1

3179	Landa Lake	Bryo-1	2024-06-12	18	Procambarus sp.		1
3179	Landa Lake	Bryo-1	2024-06-12	19	Etheostoma fonticola	30	1
3179	Landa Lake	Bryo-1	2024-06-12	20	Etheostoma fonticola	24	1
3179	Landa Lake	Bryo-1	2024-06-12	20	Etheostoma fonticola	25	1
3179	Landa Lake	Bryo-1	2024-06-12	21	Etheostoma fonticola	22	1
3179	Landa Lake	Bryo-1	2024-06-12	22	Procambarus sp.		1
3180	Landa Lake	Bryo-2	2024-06-12	1	Etheostoma fonticola	19	1
3180	Landa Lake	Bryo-2	2024-06-12	1	Etheostoma fonticola	20	1
3180	Landa Lake	Bryo-2	2024-06-12	1	Etheostoma fonticola	25	1
3180	Landa Lake	Bryo-2	2024-06-12	1	Etheostoma fonticola	23	1
3180	Landa Lake	Bryo-2	2024-06-12	1	Etheostoma fonticola	23	1
3180	Landa Lake	Bryo-2	2024-06-12	1	Etheostoma fonticola	32	1
3180	Landa Lake	Bryo-2	2024-06-12	1	Etheostoma fonticola	23	1
3180	Landa Lake	Bryo-2	2024-06-12	1	Etheostoma fonticola	15	1
3180	Landa Lake	Bryo-2	2024-06-12	1	Etheostoma fonticola	30	1
3180	Landa Lake	Bryo-2	2024-06-12	1	Etheostoma fonticola	30	1
3180	Landa Lake	Bryo-2	2024-06-12	1	Etheostoma fonticola	22	1
3180	Landa Lake	Bryo-2	2024-06-12	1	Palaemonetes sp.		12
3180	Landa Lake	Bryo-2	2024-06-12	2	Etheostoma fonticola	27	1
3180	Landa Lake	Bryo-2	2024-06-12	2	Etheostoma fonticola	31	1
3180	Landa Lake	Bryo-2	2024-06-12	2	Etheostoma fonticola	29	1
3180	Landa Lake	Bryo-2	2024-06-12	2	Procambarus sp.		1
3180	Landa Lake	Bryo-2	2024-06-12	2	Palaemonetes sp.		5
3180	Landa Lake	Bryo-2	2024-06-12	3	Palaemonetes sp.		1
3180	Landa Lake	Bryo-2	2024-06-12	3	Etheostoma fonticola	26	1
3180	Landa Lake	Bryo-2	2024-06-12	3	Etheostoma fonticola	26	1
3180	Landa Lake	Bryo-2	2024-06-12	3	Etheostoma fonticola	26	1
3180	Landa Lake	Bryo-2	2024-06-12	3	Etheostoma fonticola	24	1
3180	Landa Lake	Bryo-2	2024-06-12	3	Etheostoma fonticola	26	1
3180	Landa Lake	Bryo-2	2024-06-12	3	Etheostoma fonticola	31	1

3180	Landa Lake	Bryo-2	2024-06-12	3	Etheostoma fonticola	24	1
3180	Landa Lake	Bryo-2	2024-06-12	3	Etheostoma fonticola	32	1
3180	Landa Lake	Bryo-2	2024-06-12	3	Etheostoma fonticola	32	1
3180	Landa Lake	Bryo-2	2024-06-12	3	Etheostoma fonticola	23	1
3180	Landa Lake	Bryo-2	2024-06-12	4	Etheostoma fonticola	26	1
3180	Landa Lake	Bryo-2	2024-06-12	4	Etheostoma fonticola	29	1
3180	Landa Lake	Bryo-2	2024-06-12	4	Etheostoma fonticola	34	1
3180	Landa Lake	Bryo-2	2024-06-12	4	Etheostoma fonticola	20	1
3180	Landa Lake	Bryo-2	2024-06-12	4	Etheostoma fonticola	22	1
3180	Landa Lake	Bryo-2	2024-06-12	4	Etheostoma fonticola	26	1
3180	Landa Lake	Bryo-2	2024-06-12	4	Etheostoma fonticola	35	1
3180	Landa Lake	Bryo-2	2024-06-12	5	Etheostoma fonticola	20	1
3180	Landa Lake	Bryo-2	2024-06-12	5	Etheostoma fonticola	24	1
3180	Landa Lake	Bryo-2	2024-06-12	6	Etheostoma fonticola	22	1
3180	Landa Lake	Bryo-2	2024-06-12	7	Etheostoma fonticola	21	1
3180	Landa Lake	Bryo-2	2024-06-12	7	Palaemonetes sp.		2
3180	Landa Lake	Bryo-2	2024-06-12	8	Palaemonetes sp.		1
3180	Landa Lake	Bryo-2	2024-06-12	9	No fish collected		
3180	Landa Lake	Bryo-2	2024-06-12	10	Etheostoma fonticola	33	1
3180	Landa Lake	Bryo-2	2024-06-12	10	Etheostoma fonticola	24	1
3180	Landa Lake	Bryo-2	2024-06-12	11	Etheostoma fonticola	22	1
3180	Landa Lake	Bryo-2	2024-06-12	11	Etheostoma fonticola	26	1
3180	Landa Lake	Bryo-2	2024-06-12	11	Etheostoma fonticola	24	1
3180	Landa Lake	Bryo-2	2024-06-12	12	Etheostoma fonticola	13	1
3180	Landa Lake	Bryo-2	2024-06-12	12	Etheostoma fonticola	23	1
3180	Landa Lake	Bryo-2	2024-06-12	13	Etheostoma fonticola	28	1
3180	Landa Lake	Bryo-2	2024-06-12	13	Etheostoma fonticola	30	1
3180	Landa Lake	Bryo-2	2024-06-12	14	Etheostoma fonticola	25	1
3180	Landa Lake	Bryo-2	2024-06-12	14	Etheostoma fonticola	30	1
3180	Landa Lake	Bryo-2	2024-06-12	15	Etheostoma fonticola	30	1

3180	Landa Lake	Bryo-2	2024-06-12	15	Etheostoma fonticola	23	1
3180	Landa Lake	Bryo-2	2024-06-12	15	Procambarus sp.		1
3180	Landa Lake	Bryo-2	2024-06-12	16	Etheostoma fonticola	30	1
3180	Landa Lake	Bryo-2	2024-06-12	17	No fish collected		
3181	Landa Lake	Open-1	2024-06-12	1	No fish collected		
3181	Landa Lake	Open-1	2024-06-12	2	No fish collected		
3181	Landa Lake	Open-1	2024-06-12	3	No fish collected		
3181	Landa Lake	Open-1	2024-06-12	4	No fish collected		
3181	Landa Lake	Open-1	2024-06-12	5	No fish collected		
3181	Landa Lake	Open-1	2024-06-12	6	No fish collected		
3181	Landa Lake	Open-1	2024-06-12	7	No fish collected		
3181	Landa Lake	Open-1	2024-06-12	8	No fish collected		
3181	Landa Lake	Open-1	2024-06-12	9	No fish collected		
3181	Landa Lake	Open-1	2024-06-12	10	No fish collected		
3182	Landa Lake	Open-2	2024-06-12	1	No fish collected		
3182	Landa Lake	Open-2	2024-06-12	2	No fish collected		
3182	Landa Lake	Open-2	2024-06-12	3	No fish collected		
3182	Landa Lake	Open-2	2024-06-12	4	No fish collected		
3182	Landa Lake	Open-2	2024-06-12	5	No fish collected		
3182	Landa Lake	Open-2	2024-06-12	6	No fish collected		
3182	Landa Lake	Open-2	2024-06-12	7	No fish collected		
3182	Landa Lake	Open-2	2024-06-12	8	No fish collected		
3182	Landa Lake	Open-2	2024-06-12	9	No fish collected		
3182	Landa Lake	Open-2	2024-06-12	10	No fish collected		
3183	Landa Lake	Val-1	2024-06-12	1	Palaemonetes sp.		2
3183	Landa Lake	Val-1	2024-06-12	1	Procambarus sp.		1
3183	Landa Lake	Val-1	2024-06-12	1	Dionda nigrotaeniata	35	1
3183	Landa Lake	Val-1	2024-06-12	1	Astyanax mexicanus	48	1
3183	Landa Lake	Val-1	2024-06-12	2	Dionda nigrotaeniata	45	1
3183	Landa Lake	Val-1	2024-06-12	2	Dionda nigrotaeniata	35	1

3183	Landa Lake	Val-1	2024-06-12	2	Dionda nigrotaeniata	40	1
3183	Landa Lake	Val-1	2024-06-12	2	Dionda nigrotaeniata	40	1
3183	Landa Lake	Val-1	2024-06-12	2	Dionda nigrotaeniata	42	1
3183	Landa Lake	Val-1	2024-06-12	2	Dionda nigrotaeniata	38	1
3183	Landa Lake	Val-1	2024-06-12	2	Astyanax mexicanus	41	1
3183	Landa Lake	Val-1	2024-06-12	2	Astyanax mexicanus	47	1
3183	Landa Lake	Val-1	2024-06-12	2	Procambarus sp.		4
3183	Landa Lake	Val-1	2024-06-12	2	Lepomis miniatus	35	1
3183	Landa Lake	Val-1	2024-06-12	3	Procambarus sp.		2
3183	Landa Lake	Val-1	2024-06-12	3	Lepomis miniatus	36	1
3183	Landa Lake	Val-1	2024-06-12	3	Lepomis miniatus	42	1
3183	Landa Lake	Val-1	2024-06-12	3	Lepomis miniatus	30	1
3183	Landa Lake	Val-1	2024-06-12	3	Dionda nigrotaeniata	31	1
3183	Landa Lake	Val-1	2024-06-12	3	Dionda nigrotaeniata	29	1
3183	Landa Lake	Val-1	2024-06-12	3	Astyanax mexicanus	50	1
3183	Landa Lake	Val-1	2024-06-12	3	Astyanax mexicanus	44	1
3183	Landa Lake	Val-1	2024-06-12	3	Etheostoma fonticola	26	1
3183	Landa Lake	Val-1	2024-06-12	3	Etheostoma fonticola	29	1
3183	Landa Lake	Val-1	2024-06-12	4	Procambarus sp.		3
3183	Landa Lake	Val-1	2024-06-12	4	Lepomis miniatus	85	1
3183	Landa Lake	Val-1	2024-06-12	4	Lepomis miniatus	42	1
3183	Landa Lake	Val-1	2024-06-12	4	Astyanax mexicanus	45	1
3183	Landa Lake	Val-1	2024-06-12	4	Astyanax mexicanus	42	1
3183	Landa Lake	Val-1	2024-06-12	4	Dionda nigrotaeniata	43	1
3183	Landa Lake	Val-1	2024-06-12	4	Etheostoma fonticola	19	1
3183	Landa Lake	Val-1	2024-06-12	5	Procambarus sp.		1
3183	Landa Lake	Val-1	2024-06-12	5	Dionda nigrotaeniata	42	1
3183	Landa Lake	Val-1	2024-06-12	5	Dionda nigrotaeniata	35	1
3183	Landa Lake	Val-1	2024-06-12	5	Dionda nigrotaeniata	40	1
3183	Landa Lake	Val-1	2024-06-12	5	Astyanax mexicanus	46	1

3183	Landa Lake	Val-1	2024-06-12	5	Astyanax mexicanus	45	1
3183	Landa Lake	Val-1	2024-06-12	5	Astyanax mexicanus	51	1
3183	Landa Lake	Val-1	2024-06-12	5	Lepomis miniatus		3
3183	Landa Lake	Val-1	2024-06-12	5	Etheostoma fonticola	19	1
3183	Landa Lake	Val-1	2024-06-12	5	Etheostoma fonticola	29	1
3183	Landa Lake	Val-1	2024-06-12	6	Procambarus sp.		1
3183	Landa Lake	Val-1	2024-06-12	6	Astyanax mexicanus	50	1
3183	Landa Lake	Val-1	2024-06-12	6	Dionda nigrotaeniata	33	1
3183	Landa Lake	Val-1	2024-06-12	7	Procambarus sp.		4
3183	Landa Lake	Val-1	2024-06-12	7	Lepomis miniatus	89	1
3183	Landa Lake	Val-1	2024-06-12	7	Lepomis miniatus	54	1
3183	Landa Lake	Val-1	2024-06-12	7	Etheostoma fonticola	18	1
3183	Landa Lake	Val-1	2024-06-12	7	Etheostoma fonticola	15	1
3183	Landa Lake	Val-1	2024-06-12	7	Etheostoma fonticola	30	1
3183	Landa Lake	Val-1	2024-06-12	8	Lepomis miniatus	35	1
3183	Landa Lake	Val-1	2024-06-12	8	Lepomis miniatus	29	1
3183	Landa Lake	Val-1	2024-06-12	8	Procambarus sp.		1
3183	Landa Lake	Val-1	2024-06-12	8	Etheostoma fonticola	18	1
3183	Landa Lake	Val-1	2024-06-12	9	Dionda nigrotaeniata	34	1
3183	Landa Lake	Val-1	2024-06-12	9	Procambarus sp.		1
3183	Landa Lake	Val-1	2024-06-12	9	Etheostoma fonticola	26	1
3183	Landa Lake	Val-1	2024-06-12	9	Etheostoma fonticola	25	1
3183	Landa Lake	Val-1	2024-06-12	10	Procambarus sp.		1
3183	Landa Lake	Val-1	2024-06-12	10	Etheostoma fonticola	24	1
3183	Landa Lake	Val-1	2024-06-12	10	Lepomis miniatus	35	1
3183	Landa Lake	Val-1	2024-06-12	10	Palaemonetes sp.		1
3183	Landa Lake	Val-1	2024-06-12	11	Procambarus sp.		1
3183	Landa Lake	Val-1	2024-06-12	12	Lepomis miniatus	42	1
3183	Landa Lake	Val-1	2024-06-12	12	Etheostoma fonticola	30	1
3183	Landa Lake	Val-1	2024-06-12	13	Procambarus sp.		1

3183	Landa Lake	Val-1	2024-06-12	13	Dionda nigrotaeniata	36	1
3183	Landa Lake	Val-1	2024-06-12	14	Procambarus sp.		1
3183	Landa Lake	Val-1	2024-06-12	15	Astyanax mexicanus	52	1
3183	Landa Lake	Val-1	2024-06-12	15	Dionda nigrotaeniata	39	1
3183	Landa Lake	Val-1	2024-06-12	15	Palaemonetes sp.		1
3183	Landa Lake	Val-1	2024-06-12	15	Etheostoma fonticola	24	1
3183	Landa Lake	Val-1	2024-06-12	15	Procambarus sp.		1
3183	Landa Lake	Val-1	2024-06-12	16	Astyanax mexicanus	47	1
3183	Landa Lake	Val-1	2024-06-12	16	Dionda nigrotaeniata	42	1
3184	Landa Lake	Val-2	2024-06-12	1	Lepomis sp.	19	1
3184	Landa Lake	Val-2	2024-06-12	1	Lepomis miniatus	33	1
3184	Landa Lake	Val-2	2024-06-12	1	Lepomis miniatus	54	1
3184	Landa Lake	Val-2	2024-06-12	1	Palaemonetes sp.		10
3184	Landa Lake	Val-2	2024-06-12	2	Lepomis miniatus	100	1
3184	Landa Lake	Val-2	2024-06-12	2	Etheostoma fonticola	12	1
3184	Landa Lake	Val-2	2024-06-12	2	Etheostoma fonticola	26	1
3184	Landa Lake	Val-2	2024-06-12	2	Gambusia sp.	12	1
3184	Landa Lake	Val-2	2024-06-12	2	Gambusia sp.	10	1
3184	Landa Lake	Val-2	2024-06-12	2	Palaemonetes sp.		4
3184	Landa Lake	Val-2	2024-06-12	3	Palaemonetes sp.		4
3184	Landa Lake	Val-2	2024-06-12	3	Lepomis miniatus	36	1
3184	Landa Lake	Val-2	2024-06-12	3	Etheostoma fonticola	32	1
3184	Landa Lake	Val-2	2024-06-12	3	Gambusia sp.	10	1
3184	Landa Lake	Val-2	2024-06-12	3	Procambarus sp.		1
3184	Landa Lake	Val-2	2024-06-12	4	Palaemonetes sp.		13
3184	Landa Lake	Val-2	2024-06-12	4	Etheostoma fonticola	29	1
3184	Landa Lake	Val-2	2024-06-12	4	Etheostoma fonticola	26	1
3184	Landa Lake	Val-2	2024-06-12	4	Etheostoma fonticola	26	1
3184	Landa Lake	Val-2	2024-06-12	4	Etheostoma fonticola	25	1
3184	Landa Lake	Val-2	2024-06-12	5	Astyanax mexicanus	60	1

3184	Landa Lake	Val-2	2024-06-12	5	Etheostoma fonticola	29	1
3184	Landa Lake	Val-2	2024-06-12	5	Etheostoma fonticola	22	1
3184	Landa Lake	Val-2	2024-06-12	5	Etheostoma fonticola	24	1
3184	Landa Lake	Val-2	2024-06-12	5	Etheostoma fonticola	24	1
3184	Landa Lake	Val-2	2024-06-12	5	Palaemonetes sp.		5
3184	Landa Lake	Val-2	2024-06-12	6	Micropterus salmoides	95	1
3184	Landa Lake	Val-2	2024-06-12	6	Procambarus sp.		1
3184	Landa Lake	Val-2	2024-06-12	6	Palaemonetes sp.		2
3184	Landa Lake	Val-2	2024-06-12	6	Etheostoma fonticola	32	1
3184	Landa Lake	Val-2	2024-06-12	6	Gambusia sp.	10	1
3184	Landa Lake	Val-2	2024-06-12	7	Etheostoma fonticola	32	1
3184	Landa Lake	Val-2	2024-06-12	7	Etheostoma fonticola	29	1
3184	Landa Lake	Val-2	2024-06-12	7	Etheostoma fonticola	28	1
3184	Landa Lake	Val-2	2024-06-12	7	Palaemonetes sp.		2
3184	Landa Lake	Val-2	2024-06-12	7	Lepomis miniatus	33	1
3184	Landa Lake	Val-2	2024-06-12	8	Palaemonetes sp.		1
3184	Landa Lake	Val-2	2024-06-12	9	Palaemonetes sp.		2
3184	Landa Lake	Val-2	2024-06-12	10	Palaemonetes sp.		2
3184	Landa Lake	Val-2	2024-06-12	10	Etheostoma fonticola	33	1
3184	Landa Lake	Val-2	2024-06-12	11	Palaemonetes sp.		1
3184	Landa Lake	Val-2	2024-06-12	11	Etheostoma fonticola	27	1
3184	Landa Lake	Val-2	2024-06-12	12	Micropterus salmoides	85	1
3184	Landa Lake	Val-2	2024-06-12	12	Palaemonetes sp.		1
3184	Landa Lake	Val-2	2024-06-12	13	No fish collected		
3184	Landa Lake	Val-2	2024-06-12	14	Palaemonetes sp.		2
3184	Landa Lake	Val-2	2024-06-12	15	No fish collected		
3185	Old Channel Reach	Bryo-1	2024-06-11	1	Etheostoma fonticola	23	1
3185	Old Channel Reach	Bryo-1	2024-06-11	1	Etheostoma fonticola	28	1
3185	Old Channel Reach	Bryo-1	2024-06-11	1	Etheostoma fonticola	24	1
3185	Old Channel Reach	Bryo-1	2024-06-11	1	Etheostoma fonticola	15	1

3185	Old Channel Reach	Bryo-1	2024-06-11	2	Procambarus sp.		2
3185	Old Channel Reach	Bryo-1	2024-06-11	2	Etheostoma fonticola	30	1
3185	Old Channel Reach	Bryo-1	2024-06-11	2	Etheostoma fonticola	11	1
3185	Old Channel Reach	Bryo-1	2024-06-11	3	Etheostoma fonticola	28	1
3185	Old Channel Reach	Bryo-1	2024-06-11	3	Gambusia sp.	9	1
3185	Old Channel Reach	Bryo-1	2024-06-11	3	Notropis amabilis	13	1
3185	Old Channel Reach	Bryo-1	2024-06-11	3	Notropis amabilis	13	1
3185	Old Channel Reach	Bryo-1	2024-06-11	4	Etheostoma fonticola	20	1
3185	Old Channel Reach	Bryo-1	2024-06-11	4	Etheostoma fonticola	28	1
3185	Old Channel Reach	Bryo-1	2024-06-11	5	Procambarus sp.		1
3185	Old Channel Reach	Bryo-1	2024-06-11	6	Procambarus sp.		2
3185	Old Channel Reach	Bryo-1	2024-06-11	6	Etheostoma fonticola	28	1
3185	Old Channel Reach	Bryo-1	2024-06-11	7	Etheostoma fonticola	30	1
3185	Old Channel Reach	Bryo-1	2024-06-11	7	Procambarus sp.		1
3185	Old Channel Reach	Bryo-1	2024-06-11	8	No fish collected		
3185	Old Channel Reach	Bryo-1	2024-06-11	9	Etheostoma fonticola	27	1
3185	Old Channel Reach	Bryo-1	2024-06-11	10	Etheostoma fonticola	28	1
3185	Old Channel Reach	Bryo-1	2024-06-11	11	No fish collected		
3185	Old Channel Reach	Bryo-1	2024-06-11	12	Procambarus sp.		1
3185	Old Channel Reach	Bryo-1	2024-06-11	13	No fish collected		
3185	Old Channel Reach	Bryo-1	2024-06-11	14	No fish collected		
3185	Old Channel Reach	Bryo-1	2024-06-11	15	No fish collected		
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Etheostoma fonticola	28	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Etheostoma fonticola	27	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Etheostoma fonticola	25	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Etheostoma fonticola	30	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Etheostoma fonticola	25	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Etheostoma fonticola	30	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Etheostoma fonticola	30	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Etheostoma fonticola	19	1

3186	Old Channel Reach	Bryo-2	2024-06-11	1	Etheostoma fonticola	25	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Etheostoma fonticola	26	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Etheostoma fonticola	25	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Procambarus sp.		5
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	8	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	8	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	5	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	7	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	5	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	9	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	7	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	8	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	10	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	9	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	8	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	9	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	9	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	10	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	8	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	8	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	7	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	8	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	7	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	6	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	7	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.	7	1
3186	Old Channel Reach	Bryo-2	2024-06-11	1	Lepomis sp.		54
3186	Old Channel Reach	Bryo-2	2024-06-11	2	Procambarus sp.		6
3186	Old Channel Reach	Bryo-2	2024-06-11	2	Etheostoma fonticola	26	1
3186	Old Channel Reach	Bryo-2	2024-06-11	2	Etheostoma fonticola	30	1

3186	Old Channel Reach	Bryo-2	2024-06-11	2	Etheostoma fonticola	30	1
3186	Old Channel Reach	Bryo-2	2024-06-11	2	Etheostoma fonticola	29	1
3186	Old Channel Reach	Bryo-2	2024-06-11	2	Etheostoma fonticola	28	1
3186	Old Channel Reach	Bryo-2	2024-06-11	2	Lepomis sp.		33
3186	Old Channel Reach	Bryo-2	2024-06-11	3	Etheostoma fonticola	31	1
3186	Old Channel Reach	Bryo-2	2024-06-11	3	Etheostoma fonticola	26	1
3186	Old Channel Reach	Bryo-2	2024-06-11	3	Etheostoma fonticola	30	1
3186	Old Channel Reach	Bryo-2	2024-06-11	3	Etheostoma fonticola	29	1
3186	Old Channel Reach	Bryo-2	2024-06-11	3	Etheostoma fonticola	27	1
3186	Old Channel Reach	Bryo-2	2024-06-11	3	Etheostoma fonticola	14	1
3186	Old Channel Reach	Bryo-2	2024-06-11	3	Lepomis sp.		6
3186	Old Channel Reach	Bryo-2	2024-06-11	4	Etheostoma fonticola	26	1
3186	Old Channel Reach	Bryo-2	2024-06-11	4	Etheostoma fonticola	28	1
3186	Old Channel Reach	Bryo-2	2024-06-11	4	Procambarus sp.		1
3186	Old Channel Reach	Bryo-2	2024-06-11	5	Procambarus sp.		1
3186	Old Channel Reach	Bryo-2	2024-06-11	5	Etheostoma fonticola	25	1
3186	Old Channel Reach	Bryo-2	2024-06-11	5	Lepomis sp.		2
3186	Old Channel Reach	Bryo-2	2024-06-11	6	Procambarus sp.		2
3186	Old Channel Reach	Bryo-2	2024-06-11	6	Lepomis sp.		1
3186	Old Channel Reach	Bryo-2	2024-06-11	7	Lepomis sp.		3
3186	Old Channel Reach	Bryo-2	2024-06-11	8	Etheostoma fonticola	22	1
3186	Old Channel Reach	Bryo-2	2024-06-11	8	Etheostoma fonticola	30	1
3186	Old Channel Reach	Bryo-2	2024-06-11	8	Procambarus sp.		2
3186	Old Channel Reach	Bryo-2	2024-06-11	9	Etheostoma fonticola	29	1
3186	Old Channel Reach	Bryo-2	2024-06-11	9	Procambarus sp.		1
3186	Old Channel Reach	Bryo-2	2024-06-11	9	Lepomis sp.		2
3186	Old Channel Reach	Bryo-2	2024-06-11	10	Procambarus sp.		1
3186	Old Channel Reach	Bryo-2	2024-06-11	10	Lepomis sp.		2
3186	Old Channel Reach	Bryo-2	2024-06-11	11	Procambarus sp.		1
3186	Old Channel Reach	Bryo-2	2024-06-11	11	Lepomis sp.		1

3186	Old Channel Reach	Bryo-2	2024-06-11	12	Procambarus sp.		1
3186	Old Channel Reach	Bryo-2	2024-06-11	13	Procambarus sp.		1
3186	Old Channel Reach	Bryo-2	2024-06-11	14	Lepomis sp.		1
3186	Old Channel Reach	Bryo-2	2024-06-11	15	No fish collected		
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	25	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	30	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	33	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	25	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	27	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	25	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	32	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	27	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	30	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	28	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	30	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	26	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	31	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	24	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	30	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	29	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	29	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	21	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis amabilis	21	1
3187	Old Channel Reach	Open-1	2024-06-11	1	Notropis volucellus	28	1
3187	Old Channel Reach	Open-1	2024-06-11	2	No fish collected		
3187	Old Channel Reach	Open-1	2024-06-11	3	Notropis amabilis	25	1
3187	Old Channel Reach	Open-1	2024-06-11	3	Notropis amabilis		8
3187	Old Channel Reach	Open-1	2024-06-11	4	No fish collected		
3187	Old Channel Reach	Open-1	2024-06-11	5	No fish collected		
3187	Old Channel Reach	Open-1	2024-06-11	6	No fish collected		

3187	Old Channel Reach	Open-1	2024-06-11	7	No fish collected		
3187	Old Channel Reach	Open-1	2024-06-11	8	No fish collected		
3187	Old Channel Reach	Open-1	2024-06-11	9	No fish collected		
3187	Old Channel Reach	Open-1	2024-06-11	10	No fish collected		
3187	Old Channel Reach	Open-1	2024-06-11	11	No fish collected		
3187	Old Channel Reach	Open-1	2024-06-11	12	No fish collected		
3187	Old Channel Reach	Open-1	2024-06-11	13	No fish collected		
3187	Old Channel Reach	Open-1	2024-06-11	14	No fish collected		
3187	Old Channel Reach	Open-1	2024-06-11	15	No fish collected		
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis cyanellus	60	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1

3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	1	Lepomis sp.	7	1
3188	Old Channel Reach	Open-2	2024-06-11	2	Lepomis sp.		30
3188	Old Channel Reach	Open-2	2024-06-11	3	Lepomis sp.		5
3188	Old Channel Reach	Open-2	2024-06-11	4	Lepomis sp.		12
3188	Old Channel Reach	Open-2	2024-06-11	5	No fish collected		
3188	Old Channel Reach	Open-2	2024-06-11	6	No fish collected		
3188	Old Channel Reach	Open-2	2024-06-11	7	No fish collected		
3188	Old Channel Reach	Open-2	2024-06-11	8	Lepomis sp.		5
3188	Old Channel Reach	Open-2	2024-06-11	9	Lepomis sp.		18
3188	Old Channel Reach	Open-2	2024-06-11	10	Lepomis sp.		9
3188	Old Channel Reach	Open-2	2024-06-11	11	Lepomis sp.		11
3188	Old Channel Reach	Open-2	2024-06-11	12	No fish collected		
3188	Old Channel Reach	Open-2	2024-06-11	13	Lepomis sp.		1
3188	Old Channel Reach	Open-2	2024-06-11	14	No fish collected		
3188	Old Channel Reach	Open-2	2024-06-11	15	No fish collected		
3189	Old Channel Reach	Lud-1	2024-06-11	1	No fish collected		
3189	Old Channel Reach	Lud-1	2024-06-11	2	No fish collected		
3189	Old Channel Reach	Lud-1	2024-06-11	3	Etheostoma fonticola	25	1
3189	Old Channel Reach	Lud-1	2024-06-11	4	No fish collected		
3189	Old Channel Reach	Lud-1	2024-06-11	5	Procambarus sp.		1
3189	Old Channel Reach	Lud-1	2024-06-11	5	Lepomis sp.	10	1
3189	Old Channel Reach	Lud-1	2024-06-11	6	No fish collected		
3189	Old Channel Reach	Lud-1	2024-06-11	7	No fish collected		
3189	Old Channel Reach	Lud-1	2024-06-11	8	No fish collected		
3189	Old Channel Reach	Lud-1	2024-06-11	9	No fish collected		
3189	Old Channel Reach	Lud-1	2024-06-11	10	No fish collected		

3189	Old Channel Reach	Lud-1	2024-06-11	11	Lepomis sp.	7	1
3189	Old Channel Reach	Lud-1	2024-06-11	12	No fish collected		
3189	Old Channel Reach	Lud-1	2024-06-11	13	No fish collected		
3189	Old Channel Reach	Lud-1	2024-06-11	14	No fish collected		
3189	Old Channel Reach	Lud-1	2024-06-11	15	No fish collected		
3190	Old Channel Reach	Lud-2	2024-06-11	1	Procambarus sp.		3
3190	Old Channel Reach	Lud-2	2024-06-11	1	Palaemonetes sp.		5
3190	Old Channel Reach	Lud-2	2024-06-11	1	Etheostoma fonticola	22	1
3190	Old Channel Reach	Lud-2	2024-06-11	1	Etheostoma fonticola	30	1
3190	Old Channel Reach	Lud-2	2024-06-11	1	Etheostoma fonticola	21	1
3190	Old Channel Reach	Lud-2	2024-06-11	1	Etheostoma fonticola	28	1
3190	Old Channel Reach	Lud-2	2024-06-11	1	Etheostoma fonticola	15	1
3190	Old Channel Reach	Lud-2	2024-06-11	1	Etheostoma fonticola	22	1
3190	Old Channel Reach	Lud-2	2024-06-11	1	Etheostoma fonticola	21	1
3190	Old Channel Reach	Lud-2	2024-06-11	2	Etheostoma fonticola	22	1
3190	Old Channel Reach	Lud-2	2024-06-11	2	Etheostoma fonticola	32	1
3190	Old Channel Reach	Lud-2	2024-06-11	2	Etheostoma fonticola	23	1
3190	Old Channel Reach	Lud-2	2024-06-11	2	Procambarus sp.		9
3190	Old Channel Reach	Lud-2	2024-06-11	2	Palaemonetes sp.		6
3190	Old Channel Reach	Lud-2	2024-06-11	3	Palaemonetes sp.		1
3190	Old Channel Reach	Lud-2	2024-06-11	3	Etheostoma fonticola	25	1
3190	Old Channel Reach	Lud-2	2024-06-11	3	Etheostoma fonticola	20	1
3190	Old Channel Reach	Lud-2	2024-06-11	3	Procambarus sp.		2
3190	Old Channel Reach	Lud-2	2024-06-11	4	Procambarus sp.		1
3190	Old Channel Reach	Lud-2	2024-06-11	5	Procambarus sp.		5
3190	Old Channel Reach	Lud-2	2024-06-11	5	Etheostoma fonticola	35	1
3190	Old Channel Reach	Lud-2	2024-06-11	5	Etheostoma fonticola	25	1
3190	Old Channel Reach	Lud-2	2024-06-11	5	Palaemonetes sp.		1
3190	Old Channel Reach	Lud-2	2024-06-11	6	Etheostoma fonticola	29	1
3190	Old Channel Reach	Lud-2	2024-06-11	6	Etheostoma fonticola	21	1

3190	Old Channel Reach	Lud-2	2024-06-11	6	Etheostoma fonticola	25	1
3190	Old Channel Reach	Lud-2	2024-06-11	6	Etheostoma fonticola	22	1
3190	Old Channel Reach	Lud-2	2024-06-11	6	Palaemonetes sp.		3
3190	Old Channel Reach	Lud-2	2024-06-11	6	Procambarus sp.		2
3190	Old Channel Reach	Lud-2	2024-06-11	7	Etheostoma fonticola	24	1
3190	Old Channel Reach	Lud-2	2024-06-11	7	Etheostoma fonticola	27	1
3190	Old Channel Reach	Lud-2	2024-06-11	7	Etheostoma fonticola	28	1
3190	Old Channel Reach	Lud-2	2024-06-11	7	Etheostoma fonticola	32	1
3190	Old Channel Reach	Lud-2	2024-06-11	7	Etheostoma fonticola	22	1
3190	Old Channel Reach	Lud-2	2024-06-11	7	Procambarus sp.		6
3190	Old Channel Reach	Lud-2	2024-06-11	8	Procambarus sp.		3
3190	Old Channel Reach	Lud-2	2024-06-11	9	Procambarus sp.		1
3190	Old Channel Reach	Lud-2	2024-06-11	10	Procambarus sp.		2
3190	Old Channel Reach	Lud-2	2024-06-11	11	No fish collected		
3190	Old Channel Reach	Lud-2	2024-06-11	12	Procambarus sp.		3
3190	Old Channel Reach	Lud-2	2024-06-11	12	Etheostoma fonticola	21	1
3190	Old Channel Reach	Lud-2	2024-06-11	13	Procambarus sp.		1
3190	Old Channel Reach	Lud-2	2024-06-11	13	Etheostoma fonticola	35	1
3190	Old Channel Reach	Lud-2	2024-06-11	13	Etheostoma fonticola	26	1
3190	Old Channel Reach	Lud-2	2024-06-11	13	Etheostoma fonticola	26	1
3190	Old Channel Reach	Lud-2	2024-06-11	13	Etheostoma fonticola	22	1
3190	Old Channel Reach	Lud-2	2024-06-11	13	Gambusia sp.	10	1
3190	Old Channel Reach	Lud-2	2024-06-11	14	No fish collected		
3190	Old Channel Reach	Lud-2	2024-06-11	15	Procambarus sp.		1
3190	Old Channel Reach	Lud-2	2024-06-11	15	Palaemonetes sp.		1
3191	Upper New Channel Reach	Open-1	2024-06-17	1	No fish collected		
3191	Upper New Channel Reach	Open-1	2024-06-17	2	No fish collected		
3191	Upper New Channel Reach	Open-1	2024-06-17	3	No fish collected		
3191	Upper New Channel Reach	Open-1	2024-06-17	4	No fish collected		
3191	Upper New Channel Reach	Open-1	2024-06-17	5	No fish collected		

3191	Upper New Channel Reach	Open-1	2024-06-17	6	No fish collected		
3191	Upper New Channel Reach	Open-1	2024-06-17	7	No fish collected		
3191	Upper New Channel Reach	Open-1	2024-06-17	8	No fish collected		
3191	Upper New Channel Reach	Open-1	2024-06-17	9	No fish collected		
3191	Upper New Channel Reach	Open-1	2024-06-17	10	No fish collected		
3192	Upper New Channel Reach	Hyg-1	2024-06-17	1	Dionda nigrotaeniata	45	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	1	Procambarus sp.		2
3192	Upper New Channel Reach	Hyg-1	2024-06-17	1	Palaemonetes sp.		3
3192	Upper New Channel Reach	Hyg-1	2024-06-17	1	Lepomis gulosus	50	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	1	Herichthys cyanoguttatus	35	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	1	Lepomis cyanellus	43	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	2	Procambarus sp.		6
3192	Upper New Channel Reach	Hyg-1	2024-06-17	2	Herichthys cyanoguttatus	31	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	2	Herichthys cyanoguttatus	28	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	2	Herichthys cyanoguttatus	35	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	2	Ameiurus natalis	84	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	3	Procambarus sp.		4
3192	Upper New Channel Reach	Hyg-1	2024-06-17	3	Lepomis cyanellus	70	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	3	Palaemonetes sp.		2
3192	Upper New Channel Reach	Hyg-1	2024-06-17	4	No fish collected		
3192	Upper New Channel Reach	Hyg-1	2024-06-17	5	Herichthys cyanoguttatus	23	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	6	Procambarus sp.		1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	6	Palaemonetes sp.		2
3192	Upper New Channel Reach	Hyg-1	2024-06-17	7	Procambarus sp.		2
3192	Upper New Channel Reach	Hyg-1	2024-06-17	8	Procambarus sp.		1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	8	Lepomis miniatus	64	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	9	Lepomis gulosus	56	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	9	Herichthys cyanoguttatus	21	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	10	Procambarus sp.		1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	11	Dionda nigrotaeniata	45	1

3192	Upper New Channel Reach	Hyg-1	2024-06-17	11	Procambarus sp.		1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	12	Etheostoma fonticola	29	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	13	No fish collected		
3192	Upper New Channel Reach	Hyg-1	2024-06-17	14	Procambarus sp.		1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	14	Etheostoma fonticola	26	1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	14	Palaemonetes sp.		1
3192	Upper New Channel Reach	Hyg-1	2024-06-17	15	No fish collected		
3193	Upper New Channel Reach	Cab-1	2024-06-17	1	Palaemonetes sp.		1
3193	Upper New Channel Reach	Cab-1	2024-06-17	1	Lepomis miniatus	62	1
3193	Upper New Channel Reach	Cab-1	2024-06-17	1	Procambarus sp.		1
3193	Upper New Channel Reach	Cab-1	2024-06-17	2	Procambarus sp.		4
3193	Upper New Channel Reach	Cab-1	2024-06-17	2	Palaemonetes sp.		2
3193	Upper New Channel Reach	Cab-1	2024-06-17	3	Procambarus sp.		2
3193	Upper New Channel Reach	Cab-1	2024-06-17	4	No fish collected		
3193	Upper New Channel Reach	Cab-1	2024-06-17	5	No fish collected		
3193	Upper New Channel Reach	Cab-1	2024-06-17	6	Procambarus sp.		2
3193	Upper New Channel Reach	Cab-1	2024-06-17	6	Lepomis miniatus	50	1
3193	Upper New Channel Reach	Cab-1	2024-06-17	7	Procambarus sp.		2
3193	Upper New Channel Reach	Cab-1	2024-06-17	7	Palaemonetes sp.		1
3193	Upper New Channel Reach	Cab-1	2024-06-17	8	Procambarus sp.		1
3193	Upper New Channel Reach	Cab-1	2024-06-17	9	Procambarus sp.		3
3193	Upper New Channel Reach	Cab-1	2024-06-17	10	Procambarus sp.		1
3193	Upper New Channel Reach	Cab-1	2024-06-17	10	Herichthys cyanoguttatus	12	1
3193	Upper New Channel Reach	Cab-1	2024-06-17	11	Procambarus sp.		2
3193	Upper New Channel Reach	Cab-1	2024-06-17	12	Procambarus sp.		4
3193	Upper New Channel Reach	Cab-1	2024-06-17	12	Ambloplites rupestris	39	1
3193	Upper New Channel Reach	Cab-1	2024-06-17	13	No fish collected		
3193	Upper New Channel Reach	Cab-1	2024-06-17	14	Procambarus sp.		1
3193	Upper New Channel Reach	Cab-1	2024-06-17	15	Procambarus sp.		2
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Procambarus sp.		4

3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	30	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Herichthys cyanoguttatus		104
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Lepomis cyanellus	45	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	1	Palaemonetes sp.		5
3194	Upper New Channel Reach	Cab-2	2024-06-17	2	Procambarus sp.		2
3194	Upper New Channel Reach	Cab-2	2024-06-17	2	Palaemonetes sp.		3
3194	Upper New Channel Reach	Cab-2	2024-06-17	2	Herichthys cyanoguttatus		56
3194	Upper New Channel Reach	Cab-2	2024-06-17	3	Lepomis gulosus	59	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	3	Lepomis gulosus	65	1

3194	Upper New Channel Reach	Cab-2	2024-06-17	3	Lepomis cyanellus	52	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	3	Lepomis miniatus	55	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	3	Procambarus sp.		2
3194	Upper New Channel Reach	Cab-2	2024-06-17	3	Palaemonetes sp.		4
3194	Upper New Channel Reach	Cab-2	2024-06-17	3	Herichthys cyanoguttatus		52
3194	Upper New Channel Reach	Cab-2	2024-06-17	4	Lepomis miniatus	65	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	4	Procambarus sp.		4
3194	Upper New Channel Reach	Cab-2	2024-06-17	4	Palaemonetes sp.		1
3194	Upper New Channel Reach	Cab-2	2024-06-17	4	Herichthys cyanoguttatus		44
3194	Upper New Channel Reach	Cab-2	2024-06-17	5	Procambarus sp.		3
3194	Upper New Channel Reach	Cab-2	2024-06-17	5	Lepomis miniatus	74	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	5	Lepomis miniatus	72	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	5	Herichthys cyanoguttatus		41
3194	Upper New Channel Reach	Cab-2	2024-06-17	6	Procambarus sp.		1
3194	Upper New Channel Reach	Cab-2	2024-06-17	6	Palaemonetes sp.		3
3194	Upper New Channel Reach	Cab-2	2024-06-17	6	Herichthys cyanoguttatus		20
3194	Upper New Channel Reach	Cab-2	2024-06-17	7	Procambarus sp.		1
3194	Upper New Channel Reach	Cab-2	2024-06-17	7	Palaemonetes sp.		1
3194	Upper New Channel Reach	Cab-2	2024-06-17	7	Herichthys cyanoguttatus		18
3194	Upper New Channel Reach	Cab-2	2024-06-17	8	Procambarus sp.		4
3194	Upper New Channel Reach	Cab-2	2024-06-17	8	Lepomis miniatus	73	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	8	Palaemonetes sp.		1
3194	Upper New Channel Reach	Cab-2	2024-06-17	8	Herichthys cyanoguttatus		13
3194	Upper New Channel Reach	Cab-2	2024-06-17	9	Lepomis gulosus	70	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	9	Procambarus sp.		2
3194	Upper New Channel Reach	Cab-2	2024-06-17	9	Lepomis sp.	15	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	9	Herichthys cyanoguttatus		5
3194	Upper New Channel Reach	Cab-2	2024-06-17	10	Procambarus sp.		1
3194	Upper New Channel Reach	Cab-2	2024-06-17	10	Herichthys cyanoguttatus		24
3194	Upper New Channel Reach	Cab-2	2024-06-17	11	Procambarus sp.		4

3194	Upper New Channel Reach	Cab-2	2024-06-17	11	Herichthys cyanoguttatus		8
3194	Upper New Channel Reach	Cab-2	2024-06-17	12	Procambarus sp.		1
3194	Upper New Channel Reach	Cab-2	2024-06-17	12	Palaemonetes sp.		1
3194	Upper New Channel Reach	Cab-2	2024-06-17	12	Herichthys cyanoguttatus		8
3194	Upper New Channel Reach	Cab-2	2024-06-17	13	Procambarus sp.		2
3194	Upper New Channel Reach	Cab-2	2024-06-17	13	Herichthys cyanoguttatus		11
3194	Upper New Channel Reach	Cab-2	2024-06-17	14	Herichthys cyanoguttatus		5
3194	Upper New Channel Reach	Cab-2	2024-06-17	15	Procambarus sp.		3
3194	Upper New Channel Reach	Cab-2	2024-06-17	15	Lepomis miniatus	75	1
3194	Upper New Channel Reach	Cab-2	2024-06-17	15	Herichthys cyanoguttatus		5
3195	Upper New Channel Reach	Hyg-2	2024-06-17	1	Herichthys cyanoguttatus	58	1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	1	Herichthys cyanoguttatus	20	1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	1	Procambarus sp.		2
3195	Upper New Channel Reach	Hyg-2	2024-06-17	1	Palaemonetes sp.		6
3195	Upper New Channel Reach	Hyg-2	2024-06-17	2	Procambarus sp.		3
3195	Upper New Channel Reach	Hyg-2	2024-06-17	2	Lepomis gulosus	61	1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	2	Lepomis gulosus	74	1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	2	Herichthys cyanoguttatus	64	1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	2	Palaemonetes sp.		8
3195	Upper New Channel Reach	Hyg-2	2024-06-17	3	Procambarus sp.		4
3195	Upper New Channel Reach	Hyg-2	2024-06-17	3	Palaemonetes sp.		1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	4	Procambarus sp.		7
3195	Upper New Channel Reach	Hyg-2	2024-06-17	4	Lepomis gulosus	52	1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	4	Lepomis miniatus	56	1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	4	Palaemonetes sp.		3
3195	Upper New Channel Reach	Hyg-2	2024-06-17	5	Palaemonetes sp.		1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	5	Procambarus sp.		4
3195	Upper New Channel Reach	Hyg-2	2024-06-17	6	Procambarus sp.		2
3195	Upper New Channel Reach	Hyg-2	2024-06-17	6	Palaemonetes sp.		1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	7	Procambarus sp.		1

3195	Upper New Channel Reach	Hyg-2	2024-06-17	7	Palaemonetes sp.		2
3195	Upper New Channel Reach	Hyg-2	2024-06-17	7	Lepomis gulosus	82	1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	7	Lepomis gulosus	78	1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	8	Lepomis miniatus	56	1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	9	Procambarus sp.		2
3195	Upper New Channel Reach	Hyg-2	2024-06-17	9	Palaemonetes sp.		1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	10	Procambarus sp.		1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	11	No fish collected		
3195	Upper New Channel Reach	Hyg-2	2024-06-17	12	Procambarus sp.		1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	13	Lepomis gulosus	87	1
3195	Upper New Channel Reach	Hyg-2	2024-06-17	13	Procambarus sp.		3
3195	Upper New Channel Reach	Hyg-2	2024-06-17	14	No fish collected		
3195	Upper New Channel Reach	Hyg-2	2024-06-17	15	No fish collected		
3196	Upper New Channel Reach	Open-2	2024-06-17	1	No fish collected		
3196	Upper New Channel Reach	Open-2	2024-06-17	2	No fish collected		
3196	Upper New Channel Reach	Open-2	2024-06-17	3	No fish collected		
3196	Upper New Channel Reach	Open-2	2024-06-17	4	No fish collected		
3196	Upper New Channel Reach	Open-2	2024-06-17	5	No fish collected		
3196	Upper New Channel Reach	Open-2	2024-06-17	6	No fish collected		
3196	Upper New Channel Reach	Open-2	2024-06-17	7	No fish collected		
3196	Upper New Channel Reach	Open-2	2024-06-17	8	No fish collected		
3196	Upper New Channel Reach	Open-2	2024-06-17	9	No fish collected		
3196	Upper New Channel Reach	Open-2	2024-06-17	10	No fish collected		
3225	Upper Spring Run	Chara-1	2024-10-29	1	Astyanax mexicanus	19	1
3225	Upper Spring Run	Chara-1	2024-10-29	1	Astyanax mexicanus	15	1
3225	Upper Spring Run	Chara-1	2024-10-29	1	Lepomis sp.	20	1
3225	Upper Spring Run	Chara-1	2024-10-29	1	Lepomis sp.	14	1
3225	Upper Spring Run	Chara-1	2024-10-29	1	Lepomis sp.	10	1
3225	Upper Spring Run	Chara-1	2024-10-29	2	Herichthys cyanoguttatus	47	1
3225	Upper Spring Run	Chara-1	2024-10-29	3	Lepomis miniatus	103	1

3225	Upper Spring Run	Chara-1	2024-10-29	3	Etheostoma fonticola	25	1
3225	Upper Spring Run	Chara-1	2024-10-29	4	Etheostoma fonticola	32	1
3225	Upper Spring Run	Chara-1	2024-10-29	4	Lepomis sp.	19	1
3225	Upper Spring Run	Chara-1	2024-10-29	5	Lepomis sp.	20	1
3225	Upper Spring Run	Chara-1	2024-10-29	5	Lepomis miniatus	30	1
3225	Upper Spring Run	Chara-1	2024-10-29	6	Lepomis miniatus	105	1
3225	Upper Spring Run	Chara-1	2024-10-29	7	Lepomis miniatus	28	1
3225	Upper Spring Run	Chara-1	2024-10-29	8	No fish collected		
3225	Upper Spring Run	Chara-1	2024-10-29	9	No fish collected		
3225	Upper Spring Run	Chara-1	2024-10-29	10	No fish collected		
3225	Upper Spring Run	Chara-1	2024-10-29	11	No fish collected		
3225	Upper Spring Run	Chara-1	2024-10-29	12	No fish collected		
3225	Upper Spring Run	Chara-1	2024-10-29	13	Lepomis miniatus	98	1
3225	Upper Spring Run	Chara-1	2024-10-29	14	No fish collected		
3225	Upper Spring Run	Chara-1	2024-10-29	15	No fish collected		
3226	Upper Spring Run	Chara-2	2024-10-29	1	Astyanax mexicanus	19	1
3226	Upper Spring Run	Chara-2	2024-10-29	1	Palaemonetes sp.		2
3226	Upper Spring Run	Chara-2	2024-10-29	2	Astyanax mexicanus	15	1
3226	Upper Spring Run	Chara-2	2024-10-29	3	Procambarus sp.		1
3226	Upper Spring Run	Chara-2	2024-10-29	3	Astyanax mexicanus	15	1
3226	Upper Spring Run	Chara-2	2024-10-29	3	Astyanax mexicanus	20	1
3226	Upper Spring Run	Chara-2	2024-10-29	4	Palaemonetes sp.		1
3226	Upper Spring Run	Chara-2	2024-10-29	5	Palaemonetes sp.		1
3226	Upper Spring Run	Chara-2	2024-10-29	5	Astyanax mexicanus	22	1
3226	Upper Spring Run	Chara-2	2024-10-29	5	Astyanax mexicanus	22	1
3226	Upper Spring Run	Chara-2	2024-10-29	5	Astyanax mexicanus	11	1
3226	Upper Spring Run	Chara-2	2024-10-29	5	Astyanax mexicanus	10	1
3226	Upper Spring Run	Chara-2	2024-10-29	5	Astyanax mexicanus	18	1
3226	Upper Spring Run	Chara-2	2024-10-29	5	Lepomis sp.	30	1
3226	Upper Spring Run	Chara-2	2024-10-29	6	Astyanax mexicanus	16	1

3226	Upper Spring Run	Chara-2	2024-10-29	6	Astyanax mexicanus	20	1
3226	Upper Spring Run	Chara-2	2024-10-29	6	Dionda nigrotaeniata	22	1
3226	Upper Spring Run	Chara-2	2024-10-29	6	Palaemonetes sp.		1
3226	Upper Spring Run	Chara-2	2024-10-29	7	Palaemonetes sp.		1
3226	Upper Spring Run	Chara-2	2024-10-29	7	Etheostoma fonticola	28	1
3226	Upper Spring Run	Chara-2	2024-10-29	7	Lepomis sp.	10	1
3226	Upper Spring Run	Chara-2	2024-10-29	8	Astyanax mexicanus	10	1
3226	Upper Spring Run	Chara-2	2024-10-29	8	Palaemonetes sp.		1
3226	Upper Spring Run	Chara-2	2024-10-29	9	Lepomis sp.	20	1
3226	Upper Spring Run	Chara-2	2024-10-29	10	Lepomis miniatus	86	1
3226	Upper Spring Run	Chara-2	2024-10-29	10	Astyanax mexicanus	22	1
3226	Upper Spring Run	Chara-2	2024-10-29	10	Astyanax mexicanus		1
3226	Upper Spring Run	Chara-2	2024-10-29	10	Lepomis sp.	10	1
3226	Upper Spring Run	Chara-2	2024-10-29	10	Lepomis sp.	10	1
3226	Upper Spring Run	Chara-2	2024-10-29	10	Palaemonetes sp.		1
3226	Upper Spring Run	Chara-2	2024-10-29	11	Lepomis miniatus	54	1
3226	Upper Spring Run	Chara-2	2024-10-29	11	Astyanax mexicanus		1
3226	Upper Spring Run	Chara-2	2024-10-29	11	Palaemonetes sp.		1
3226	Upper Spring Run	Chara-2	2024-10-29	12	Etheostoma fonticola	35	1
3226	Upper Spring Run	Chara-2	2024-10-29	13	Astyanax mexicanus		1
3226	Upper Spring Run	Chara-2	2024-10-29	14	Lepomis sp.	7	1
3226	Upper Spring Run	Chara-2	2024-10-29	15	Palaemonetes sp.		1
3226	Upper Spring Run	Chara-2	2024-10-29	1	Lepomis miniatus	25	1
3226	Upper Spring Run	Chara-2	2024-10-29	1	Lepomis sp.	20	1
3226	Upper Spring Run	Chara-2	2024-10-29	1	Lepomis sp.	10	1
3226	Upper Spring Run	Chara-2	2024-10-29	1	Lepomis sp.	20	1
3226	Upper Spring Run	Chara-2	2024-10-29	1	Lepomis sp.	19	1
3226	Upper Spring Run	Chara-2	2024-10-29	1	Astyanax mexicanus	14	1
3226	Upper Spring Run	Chara-2	2024-10-29	1	Astyanax mexicanus	25	1
3226	Upper Spring Run	Chara-2	2024-10-29	1	Astyanax mexicanus	22	1

3226	Upper Spring Run	Chara-2	2024-10-29	1	Astyanax mexicanus	18	1
3226	Upper Spring Run	Chara-2	2024-10-29	1	Astyanax mexicanus	28	1
3226	Upper Spring Run	Chara-2	2024-10-29	1	Astyanax mexicanus	22	1
3226	Upper Spring Run	Chara-2	2024-10-29	1	Astyanax mexicanus	20	1
3227	Upper Spring Run	Bryo-1	2024-10-29	1	No fish collected		
3227	Upper Spring Run	Bryo-1	2024-10-29	2	No fish collected		
3227	Upper Spring Run	Bryo-1	2024-10-29	3	No fish collected		
3227	Upper Spring Run	Bryo-1	2024-10-29	4	No fish collected		
3227	Upper Spring Run	Bryo-1	2024-10-29	5	Etheostoma fonticola	12	1
3227	Upper Spring Run	Bryo-1	2024-10-29	5	Lepomis sp.	8	1
3227	Upper Spring Run	Bryo-1	2024-10-29	6	No fish collected		
3227	Upper Spring Run	Bryo-1	2024-10-29	7	Etheostoma fonticola	22	1
3227	Upper Spring Run	Bryo-1	2024-10-29	7	Lepomis sp.	18	1
3227	Upper Spring Run	Bryo-1	2024-10-29	8	Procambarus sp.		1
3227	Upper Spring Run	Bryo-1	2024-10-29	8	Etheostoma fonticola	18	1
3227	Upper Spring Run	Bryo-1	2024-10-29	9	No fish collected		
3227	Upper Spring Run	Bryo-1	2024-10-29	10	No fish collected		
3227	Upper Spring Run	Bryo-1	2024-10-29	11	No fish collected		
3227	Upper Spring Run	Bryo-1	2024-10-29	12	No fish collected		
3227	Upper Spring Run	Bryo-1	2024-10-29	13	No fish collected		
3227	Upper Spring Run	Bryo-1	2024-10-29	14	No fish collected		
3227	Upper Spring Run	Bryo-1	2024-10-29	15	No fish collected		
3228	Upper Spring Run	Bryo-2	2024-10-29	1	No fish collected		
3228	Upper Spring Run	Bryo-2	2024-10-29	2	No fish collected		
3228	Upper Spring Run	Bryo-2	2024-10-29	3	No fish collected		
3228	Upper Spring Run	Bryo-2	2024-10-29	4	Etheostoma fonticola	20	1
3228	Upper Spring Run	Bryo-2	2024-10-29	5	No fish collected		
3228	Upper Spring Run	Bryo-2	2024-10-29	6	No fish collected		
3228	Upper Spring Run	Bryo-2	2024-10-29	7	Etheostoma fonticola	25	1
3228	Upper Spring Run	Bryo-2	2024-10-29	7	Etheostoma fonticola	18	1

3228	Upper Spring Run	Bryo-2	2024-10-29	8	No fish collected		
3228	Upper Spring Run	Bryo-2	2024-10-29	9	No fish collected		
3228	Upper Spring Run	Bryo-2	2024-10-29	10	No fish collected		
3228	Upper Spring Run	Bryo-2	2024-10-29	11	No fish collected		
3228	Upper Spring Run	Bryo-2	2024-10-29	12	Etheostoma fonticola	22	1
3228	Upper Spring Run	Bryo-2	2024-10-29	13	Etheostoma fonticola	30	1
3228	Upper Spring Run	Bryo-2	2024-10-29	14	No fish collected		
3228	Upper Spring Run	Bryo-2	2024-10-29	15	No fish collected		
3229	Upper Spring Run	Open-1	2024-10-29	1	No fish collected		
3229	Upper Spring Run	Open-1	2024-10-29	2	No fish collected		
3229	Upper Spring Run	Open-1	2024-10-29	3	Procambarus sp.		1
3229	Upper Spring Run	Open-1	2024-10-29	4	No fish collected		
3229	Upper Spring Run	Open-1	2024-10-29	5	No fish collected		
3229	Upper Spring Run	Open-1	2024-10-29	6	No fish collected		
3229	Upper Spring Run	Open-1	2024-10-29	7	No fish collected		
3229	Upper Spring Run	Open-1	2024-10-29	8	No fish collected		
3229	Upper Spring Run	Open-1	2024-10-29	9	No fish collected		
3229	Upper Spring Run	Open-1	2024-10-29	10	No fish collected		
3230	Upper Spring Run	Open-2	2024-10-29	1	No fish collected		
3230	Upper Spring Run	Open-2	2024-10-29	2	No fish collected		
3230	Upper Spring Run	Open-2	2024-10-29	3	No fish collected		
3230	Upper Spring Run	Open-2	2024-10-29	4	No fish collected		
3230	Upper Spring Run	Open-2	2024-10-29	5	No fish collected		
3230	Upper Spring Run	Open-2	2024-10-29	6	No fish collected		
3230	Upper Spring Run	Open-2	2024-10-29	7	No fish collected		
3230	Upper Spring Run	Open-2	2024-10-29	8	No fish collected		
3230	Upper Spring Run	Open-2	2024-10-29	9	No fish collected		
3230	Upper Spring Run	Open-2	2024-10-29	10	No fish collected		
3231	Old Channel Reach	Bryo-1	2024-10-29	1	Lepomis miniatus	35	1
3231	Old Channel Reach	Bryo-1	2024-10-29	1	Palaemonetes sp.		9

3231	Old Channel Reach	Bryo-1	2024-10-29	1	Etheostoma fonticola	30	1
3231	Old Channel Reach	Bryo-1	2024-10-29	1	Etheostoma fonticola	9	1
3231	Old Channel Reach	Bryo-1	2024-10-29	2	Palaemonetes sp.		6
3231	Old Channel Reach	Bryo-1	2024-10-29	3	Palaemonetes sp.		6
3231	Old Channel Reach	Bryo-1	2024-10-29	4	Palaemonetes sp.		2
3231	Old Channel Reach	Bryo-1	2024-10-29	5	Palaemonetes sp.		1
3231	Old Channel Reach	Bryo-1	2024-10-29	6	No fish collected		
3231	Old Channel Reach	Bryo-1	2024-10-29	7	Palaemonetes sp.		5
3231	Old Channel Reach	Bryo-1	2024-10-29	7	Etheostoma fonticola	31	1
3231	Old Channel Reach	Bryo-1	2024-10-29	7	Etheostoma fonticola	32	1
3231	Old Channel Reach	Bryo-1	2024-10-29	8	Palaemonetes sp.		3
3231	Old Channel Reach	Bryo-1	2024-10-29	9	Lepomis miniatus	60	1
3231	Old Channel Reach	Bryo-1	2024-10-29	9	Etheostoma fonticola	28	1
3231	Old Channel Reach	Bryo-1	2024-10-29	10	Etheostoma fonticola	34	1
3231	Old Channel Reach	Bryo-1	2024-10-29	11	No fish collected		
3231	Old Channel Reach	Bryo-1	2024-10-29	12	No fish collected		
3231	Old Channel Reach	Bryo-1	2024-10-29	13	No fish collected		
3231	Old Channel Reach	Bryo-1	2024-10-29	14	No fish collected		
3231	Old Channel Reach	Bryo-1	2024-10-29	15	Palaemonetes sp.		1
3232	Old Channel Reach	Bryo-2	2024-10-29	1	Etheostoma fonticola	31	1
3232	Old Channel Reach	Bryo-2	2024-10-29	1	Etheostoma fonticola	9	1
3232	Old Channel Reach	Bryo-2	2024-10-29	1	Etheostoma fonticola	10	1
3232	Old Channel Reach	Bryo-2	2024-10-29	1	Etheostoma fonticola	12	1
3232	Old Channel Reach	Bryo-2	2024-10-29	1	Palaemonetes sp.		5
3232	Old Channel Reach	Bryo-2	2024-10-29	2	Procambarus sp.		1
3232	Old Channel Reach	Bryo-2	2024-10-29	2	Palaemonetes sp.		8
3232	Old Channel Reach	Bryo-2	2024-10-29	2	Lepomis miniatus	34	1
3232	Old Channel Reach	Bryo-2	2024-10-29	3	Ameiurus natalis	42	1
3232	Old Channel Reach	Bryo-2	2024-10-29	3	Palaemonetes sp.		3
3232	Old Channel Reach	Bryo-2	2024-10-29	3	Procambarus sp.		1

3232	Old Channel Reach	Bryo-2	2024-10-29	4	Palaemonetes sp.		2
3232	Old Channel Reach	Bryo-2	2024-10-29	4	Procambarus sp.		2
3232	Old Channel Reach	Bryo-2	2024-10-29	5	Procambarus sp.		3
3232	Old Channel Reach	Bryo-2	2024-10-29	6	No fish collected		
3232	Old Channel Reach	Bryo-2	2024-10-29	7	Herichthys cyanoguttatus	34	1
3232	Old Channel Reach	Bryo-2	2024-10-29	7	Procambarus sp.		5
3232	Old Channel Reach	Bryo-2	2024-10-29	8	Procambarus sp.		5
3232	Old Channel Reach	Bryo-2	2024-10-29	8	Palaemonetes sp.		1
3232	Old Channel Reach	Bryo-2	2024-10-29	9	Palaemonetes sp.		1
3232	Old Channel Reach	Bryo-2	2024-10-29	10	No fish collected		
3232	Old Channel Reach	Bryo-2	2024-10-29	11	Procambarus sp.		5
3232	Old Channel Reach	Bryo-2	2024-10-29	11	Ameiurus natalis	55	1
3232	Old Channel Reach	Bryo-2	2024-10-29	12	Procambarus sp.		1
3232	Old Channel Reach	Bryo-2	2024-10-29	13	No fish collected		
3232	Old Channel Reach	Bryo-2	2024-10-29	14	No fish collected		
3232	Old Channel Reach	Bryo-2	2024-10-29	15	No fish collected		
3232	Old Channel Reach	Bryo-2	2024-10-29				
3233	Old Channel Reach	Lud-1	2024-10-29	1	Palaemonetes sp.		1
3233	Old Channel Reach	Lud-1	2024-10-29	2	Etheostoma fonticola	25	1
3233	Old Channel Reach	Lud-1	2024-10-29	3	Lepomis miniatus	39	1
3233	Old Channel Reach	Lud-1	2024-10-29	4	Etheostoma fonticola	15	1
3233	Old Channel Reach	Lud-1	2024-10-29	5	Palaemonetes sp.		1
3233	Old Channel Reach	Lud-1	2024-10-29	5	Herichthys cyanoguttatus	38	1
3233	Old Channel Reach	Lud-1	2024-10-29	5	Herichthys cyanoguttatus	28	1
3233	Old Channel Reach	Lud-1	2024-10-29	6	No fish collected		
3233	Old Channel Reach	Lud-1	2024-10-29	7	No fish collected		
3233	Old Channel Reach	Lud-1	2024-10-29	8	No fish collected		
3233	Old Channel Reach	Lud-1	2024-10-29	9	Herichthys cyanoguttatus	40	1
3233	Old Channel Reach	Lud-1	2024-10-29	10	Etheostoma fonticola	15	1
3233	Old Channel Reach	Lud-1	2024-10-29	11	No fish collected		

3233	Old Channel Reach	Lud-1	2024-10-29	12	No fish collected		
3233	Old Channel Reach	Lud-1	2024-10-29	13	No fish collected		
3233	Old Channel Reach	Lud-1	2024-10-29	14	No fish collected		
3233	Old Channel Reach	Lud-1	2024-10-29	15	No fish collected		
3234	Old Channel Reach	Lud-2	2024-10-29	1	Herichthys cyanoguttatus	21	1
3234	Old Channel Reach	Lud-2	2024-10-29	1	Lepomis miniatus	43	1
3234	Old Channel Reach	Lud-2	2024-10-29	1	Palaemonetes sp.		17
3234	Old Channel Reach	Lud-2	2024-10-29	1	Procambarus sp.		4
3234	Old Channel Reach	Lud-2	2024-10-29	2	Procambarus sp.		3
3234	Old Channel Reach	Lud-2	2024-10-29	2	Lepomis miniatus	57	1
3234	Old Channel Reach	Lud-2	2024-10-29	2	Lepomis miniatus	42	1
3234	Old Channel Reach	Lud-2	2024-10-29	2	Etheostoma fonticola	30	1
3234	Old Channel Reach	Lud-2	2024-10-29	2	Palaemonetes sp.		4
3234	Old Channel Reach	Lud-2	2024-10-29	3	Procambarus sp.		1
3234	Old Channel Reach	Lud-2	2024-10-29	3	Palaemonetes sp.		8
3234	Old Channel Reach	Lud-2	2024-10-29	4	Procambarus sp.		1
3234	Old Channel Reach	Lud-2	2024-10-29	4	Palaemonetes sp.		6
3234	Old Channel Reach	Lud-2	2024-10-29	5	No fish collected		
3234	Old Channel Reach	Lud-2	2024-10-29	6	Palaemonetes sp.		1
3234	Old Channel Reach	Lud-2	2024-10-29	7	Palaemonetes sp.		1
3234	Old Channel Reach	Lud-2	2024-10-29	8	No fish collected		
3234	Old Channel Reach	Lud-2	2024-10-29	9	No fish collected		
3234	Old Channel Reach	Lud-2	2024-10-29	10	Etheostoma fonticola	35	1
3234	Old Channel Reach	Lud-2	2024-10-29	10	Palaemonetes sp.		2
3234	Old Channel Reach	Lud-2	2024-10-29	11	Palaemonetes sp.		1
3234	Old Channel Reach	Lud-2	2024-10-29	12	Lepomis miniatus	46	1
3234	Old Channel Reach	Lud-2	2024-10-29	12	Palaemonetes sp.		2
3234	Old Channel Reach	Lud-2	2024-10-29	12	Procambarus sp.		2
3234	Old Channel Reach	Lud-2	2024-10-29	13	Palaemonetes sp.		1
3234	Old Channel Reach	Lud-2	2024-10-29	14	Palaemonetes sp.		1

3234	Old Channel Reach	Lud-2	2024-10-29	15	No fish collected		
3234	Old Channel Reach	Lud-2	2024-10-29	1	Lepomis miniatus	55	1
3235	Old Channel Reach	Open-1	2024-10-29	1	No fish collected		
3235	Old Channel Reach	Open-1	2024-10-29	2	No fish collected		
3235	Old Channel Reach	Open-1	2024-10-29	3	No fish collected		
3235	Old Channel Reach	Open-1	2024-10-29	4	No fish collected		
3235	Old Channel Reach	Open-1	2024-10-29	5	No fish collected		
3235	Old Channel Reach	Open-1	2024-10-29	6	No fish collected		
3235	Old Channel Reach	Open-1	2024-10-29	7	No fish collected		
3235	Old Channel Reach	Open-1	2024-10-29	8	No fish collected		
3235	Old Channel Reach	Open-1	2024-10-29	9	No fish collected		
3235	Old Channel Reach	Open-1	2024-10-29	10	No fish collected		
3236	Old Channel Reach	Open-2	2024-10-29	1	No fish collected		
3236	Old Channel Reach	Open-2	2024-10-29	2	No fish collected		
3236	Old Channel Reach	Open-2	2024-10-29	3	No fish collected		
3236	Old Channel Reach	Open-2	2024-10-29	4	No fish collected		
3236	Old Channel Reach	Open-2	2024-10-29	5	No fish collected		
3236	Old Channel Reach	Open-2	2024-10-29	6	No fish collected		
3236	Old Channel Reach	Open-2	2024-10-29	7	No fish collected		
3236	Old Channel Reach	Open-2	2024-10-29	8	No fish collected		
3236	Old Channel Reach	Open-2	2024-10-29	9	No fish collected		
3236	Old Channel Reach	Open-2	2024-10-29	10	No fish collected		
3237	Landa Lake	Val-1	2024-10-30	1	Procambarus sp.		1
3237	Landa Lake	Val-1	2024-10-30	1	Astyanax mexicanus	69	1
3237	Landa Lake	Val-1	2024-10-30	1	Astyanax mexicanus	68	1
3237	Landa Lake	Val-1	2024-10-30	1	Astyanax mexicanus	63	1
3237	Landa Lake	Val-1	2024-10-30	1	Astyanax mexicanus	71	1
3237	Landa Lake	Val-1	2024-10-30	1	Gambusia sp.	36	1
3237	Landa Lake	Val-1	2024-10-30	1	Gambusia sp.	20	1
3237	Landa Lake	Val-1	2024-10-30	1	Gambusia sp.	20	1

3237	Landa Lake	Val-1	2024-10-30	1	Gambusia sp.	25	1
3237	Landa Lake	Val-1	2024-10-30	1	Gambusia sp.	25	1
3237	Landa Lake	Val-1	2024-10-30	1	Gambusia sp.	28	1
3237	Landa Lake	Val-1	2024-10-30	1	Gambusia sp.	24	1
3237	Landa Lake	Val-1	2024-10-30	1	Gambusia sp.	35	1
3237	Landa Lake	Val-1	2024-10-30	1	Gambusia sp.	27	1
3237	Landa Lake	Val-1	2024-10-30	1	Gambusia sp.	15	1
3237	Landa Lake	Val-1	2024-10-30	1	Gambusia sp.	9	1
3237	Landa Lake	Val-1	2024-10-30	1	Gambusia sp.	14	1
3237	Landa Lake	Val-1	2024-10-30	2	Gambusia sp.	20	1
3237	Landa Lake	Val-1	2024-10-30	2	Gambusia sp.	25	1
3237	Landa Lake	Val-1	2024-10-30	2	Gambusia sp.	36	1
3237	Landa Lake	Val-1	2024-10-30	2	Gambusia sp.	25	1
3237	Landa Lake	Val-1	2024-10-30	2	Gambusia sp.	17	1
3237	Landa Lake	Val-1	2024-10-30	2	Gambusia sp.	25	1
3237	Landa Lake	Val-1	2024-10-30	3	Astyanax mexicanus	72	1
3237	Landa Lake	Val-1	2024-10-30	3	Gambusia sp.	22	1
3237	Landa Lake	Val-1	2024-10-30	3	Gambusia sp.	27	1
3237	Landa Lake	Val-1	2024-10-30	4	Gambusia sp.		4
3237	Landa Lake	Val-1	2024-10-30	5	No fish collected		
3237	Landa Lake	Val-1	2024-10-30	6	No fish collected		
3237	Landa Lake	Val-1	2024-10-30	7	No fish collected		
3237	Landa Lake	Val-1	2024-10-30	8	Astyanax mexicanus	64	1
3237	Landa Lake	Val-1	2024-10-30	9	No fish collected		
3237	Landa Lake	Val-1	2024-10-30	10	Procambarus sp.		1
3237	Landa Lake	Val-1	2024-10-30	11	No fish collected		
3237	Landa Lake	Val-1	2024-10-30	12	No fish collected		
3237	Landa Lake	Val-1	2024-10-30	13	No fish collected		
3237	Landa Lake	Val-1	2024-10-30	14	No fish collected		
3237	Landa Lake	Val-1	2024-10-30	15	Gambusia sp.		1

3238	Landa Lake	Val-2	2024-10-30	1	Dionda nigrotaeniata	65	1
3238	Landa Lake	Val-2	2024-10-30	2	Dionda nigrotaeniata	54	1
3238	Landa Lake	Val-2	2024-10-30	2	Procambarus sp.		1
3238	Landa Lake	Val-2	2024-10-30	3	Etheostoma fonticola	30	1
3238	Landa Lake	Val-2	2024-10-30	3	Etheostoma fonticola	32	1
3238	Landa Lake	Val-2	2024-10-30	3	Etheostoma fonticola	28	1
3238	Landa Lake	Val-2	2024-10-30	3	Procambarus sp.		1
3238	Landa Lake	Val-2	2024-10-30	4	Dionda nigrotaeniata	59	1
3238	Landa Lake	Val-2	2024-10-30	4	Dionda nigrotaeniata	60	1
3238	Landa Lake	Val-2	2024-10-30	5	No fish collected		
3238	Landa Lake	Val-2	2024-10-30	6	No fish collected		
3238	Landa Lake	Val-2	2024-10-30	7	No fish collected		
3238	Landa Lake	Val-2	2024-10-30	8	Dionda nigrotaeniata	61	1
3238	Landa Lake	Val-2	2024-10-30	8	Etheostoma fonticola	32	1
3238	Landa Lake	Val-2	2024-10-30	9	No fish collected		
3238	Landa Lake	Val-2	2024-10-30	10	Etheostoma fonticola	25	1
3238	Landa Lake	Val-2	2024-10-30	10	Etheostoma fonticola	25	1
3238	Landa Lake	Val-2	2024-10-30	10	Procambarus sp.		2
3238	Landa Lake	Val-2	2024-10-30	11	Procambarus sp.		1
3238	Landa Lake	Val-2	2024-10-30	12	No fish collected		
3238	Landa Lake	Val-2	2024-10-30	13	No fish collected		
3238	Landa Lake	Val-2	2024-10-30	14	No fish collected		
3238	Landa Lake	Val-2	2024-10-30	15	No fish collected		
3239	Landa Lake	Bryo-1	2024-10-30	1	Procambarus sp.		7
3239	Landa Lake	Bryo-1	2024-10-30	2	Etheostoma fonticola	30	1
3239	Landa Lake	Bryo-1	2024-10-30	2	Etheostoma fonticola	25	1
3239	Landa Lake	Bryo-1	2024-10-30	2	Etheostoma fonticola	25	1
3239	Landa Lake	Bryo-1	2024-10-30	2	Procambarus sp.		5
3239	Landa Lake	Bryo-1	2024-10-30	3	Etheostoma fonticola	27	1
3239	Landa Lake	Bryo-1	2024-10-30	3	Etheostoma fonticola	30	1

3239	Landa Lake	Bryo-1	2024-10-30	3	Etheostoma fonticola	32	1
3239	Landa Lake	Bryo-1	2024-10-30	4	No fish collected		
3239	Landa Lake	Bryo-1	2024-10-30	5	Etheostoma fonticola	31	1
3239	Landa Lake	Bryo-1	2024-10-30	5	Etheostoma fonticola	30	1
3239	Landa Lake	Bryo-1	2024-10-30	5	Etheostoma fonticola	32	1
3239	Landa Lake	Bryo-1	2024-10-30	5	Etheostoma fonticola	30	1
3239	Landa Lake	Bryo-1	2024-10-30	6	No fish collected		
3239	Landa Lake	Bryo-1	2024-10-30	7	Etheostoma fonticola	29	1
3239	Landa Lake	Bryo-1	2024-10-30	8	Etheostoma fonticola	35	1
3239	Landa Lake	Bryo-1	2024-10-30	8	Etheostoma fonticola	29	1
3239	Landa Lake	Bryo-1	2024-10-30	8	Procambarus sp.		1
3239	Landa Lake	Bryo-1	2024-10-30	9	No fish collected		
3239	Landa Lake	Bryo-1	2024-10-30	10	No fish collected		
3239	Landa Lake	Bryo-1	2024-10-30	11	No fish collected		
3239	Landa Lake	Bryo-1	2024-10-30	12	No fish collected		
3239	Landa Lake	Bryo-1	2024-10-30	13	No fish collected		
3239	Landa Lake	Bryo-1	2024-10-30	14	No fish collected		
3239	Landa Lake	Bryo-1	2024-10-30	15	No fish collected		
3240	Landa Lake	Open-1	2024-10-30	1	No fish collected		
3240	Landa Lake	Open-1	2024-10-30	2	No fish collected		
3240	Landa Lake	Open-1	2024-10-30	3	No fish collected		
3240	Landa Lake	Open-1	2024-10-30	4	No fish collected		
3240	Landa Lake	Open-1	2024-10-30	5	No fish collected		
3240	Landa Lake	Open-1	2024-10-30	6	No fish collected		
3240	Landa Lake	Open-1	2024-10-30	7	No fish collected		
3240	Landa Lake	Open-1	2024-10-30	8	No fish collected		
3240	Landa Lake	Open-1	2024-10-30	9	No fish collected		
3240	Landa Lake	Open-1	2024-10-30	10	No fish collected		
3241	Landa Lake	Open-2	2024-10-30	1	No fish collected		
3241	Landa Lake	Open-2	2024-10-30	2	No fish collected		

3241	Landa Lake	Open-2	2024-10-30	3	No fish collected		
3241	Landa Lake	Open-2	2024-10-30	4	No fish collected		
3241	Landa Lake	Open-2	2024-10-30	5	No fish collected		
3241	Landa Lake	Open-2	2024-10-30	6	No fish collected		
3241	Landa Lake	Open-2	2024-10-30	7	No fish collected		
3241	Landa Lake	Open-2	2024-10-30	8	No fish collected		
3241	Landa Lake	Open-2	2024-10-30	9	No fish collected		
3241	Landa Lake	Open-2	2024-10-30	10	No fish collected		
3242	Landa Lake	Bryo-2	2024-10-30	2	Palaemonetes sp.		4
3242	Landa Lake	Bryo-2	2024-10-30	3	Etheostoma fonticola	13	1
3242	Landa Lake	Bryo-2	2024-10-30	3	Etheostoma fonticola	11	1
3242	Landa Lake	Bryo-2	2024-10-30	3	Etheostoma fonticola	9	1
3242	Landa Lake	Bryo-2	2024-10-30	3	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	4	Palaemonetes sp.		1
3242	Landa Lake	Bryo-2	2024-10-30	4	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	4	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	4	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	5	Etheostoma fonticola	11	1
3242	Landa Lake	Bryo-2	2024-10-30	5	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	5	Etheostoma fonticola	13	1
3242	Landa Lake	Bryo-2	2024-10-30	5	Etheostoma fonticola	13	1
3242	Landa Lake	Bryo-2	2024-10-30	6	Etheostoma fonticola	11	1
3242	Landa Lake	Bryo-2	2024-10-30	6	Etheostoma fonticola	9	1
3242	Landa Lake	Bryo-2	2024-10-30	6	Etheostoma fonticola	11	1
3242	Landa Lake	Bryo-2	2024-10-30	7	Etheostoma fonticola	14	1
3242	Landa Lake	Bryo-2	2024-10-30	7	Etheostoma fonticola	29	1
3242	Landa Lake	Bryo-2	2024-10-30	7	Etheostoma fonticola	15	1
3242	Landa Lake	Bryo-2	2024-10-30	7	Etheostoma fonticola	25	1
3242	Landa Lake	Bryo-2	2024-10-30	7	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	7	Etheostoma fonticola	19	1

3242	Landa Lake	Bryo-2	2024-10-30	7	Etheostoma fonticola	13	1
3242	Landa Lake	Bryo-2	2024-10-30	7	Etheostoma fonticola	11	1
3242	Landa Lake	Bryo-2	2024-10-30	7	Etheostoma fonticola	18	1
3242	Landa Lake	Bryo-2	2024-10-30	7	Etheostoma fonticola	10	1
3242	Landa Lake	Bryo-2	2024-10-30	7	Procambarus sp.		1
3242	Landa Lake	Bryo-2	2024-10-30	8	Etheostoma fonticola	25	1
3242	Landa Lake	Bryo-2	2024-10-30	8	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	8	Etheostoma fonticola	15	1
3242	Landa Lake	Bryo-2	2024-10-30	8	Etheostoma fonticola	11	1
3242	Landa Lake	Bryo-2	2024-10-30	8	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	8	Etheostoma fonticola	8	1
3242	Landa Lake	Bryo-2	2024-10-30	8	Etheostoma fonticola	9	1
3242	Landa Lake	Bryo-2	2024-10-30	8	Etheostoma fonticola	13	1
3242	Landa Lake	Bryo-2	2024-10-30	8	Dionda nigrotaeniata	15	1
3242	Landa Lake	Bryo-2	2024-10-30	9	Etheostoma fonticola	10	1
3242	Landa Lake	Bryo-2	2024-10-30	9	Etheostoma fonticola	9	1
3242	Landa Lake	Bryo-2	2024-10-30	9	Etheostoma fonticola	15	1
3242	Landa Lake	Bryo-2	2024-10-30	9	Etheostoma fonticola	10	1
3242	Landa Lake	Bryo-2	2024-10-30	9	Procambarus sp.		1
3242	Landa Lake	Bryo-2	2024-10-30	10	Etheostoma fonticola	15	1
3242	Landa Lake	Bryo-2	2024-10-30	10	Etheostoma fonticola	15	1
3242	Landa Lake	Bryo-2	2024-10-30	11	Etheostoma fonticola	34	1
3242	Landa Lake	Bryo-2	2024-10-30	11	Etheostoma fonticola	10	1
3242	Landa Lake	Bryo-2	2024-10-30	11	Etheostoma fonticola	13	1
3242	Landa Lake	Bryo-2	2024-10-30	11	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	11	Etheostoma fonticola	13	1
3242	Landa Lake	Bryo-2	2024-10-30	12	Procambarus sp.		1
3242	Landa Lake	Bryo-2	2024-10-30	12	Etheostoma fonticola	33	1
3242	Landa Lake	Bryo-2	2024-10-30	12	Etheostoma fonticola	23	1
3242	Landa Lake	Bryo-2	2024-10-30	12	Etheostoma fonticola	11	1

3242	Landa Lake	Bryo-2	2024-10-30	12	Etheostoma fonticola	15	1
3242	Landa Lake	Bryo-2	2024-10-30	12	Etheostoma fonticola	14	1
3242	Landa Lake	Bryo-2	2024-10-30	12	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	13	Etheostoma fonticola	7	1
3242	Landa Lake	Bryo-2	2024-10-30	14	Etheostoma fonticola	10	1
3242	Landa Lake	Bryo-2	2024-10-30	15	No fish collected		
3242	Landa Lake	Bryo-2	2024-10-30	1	Procambarus sp.		4
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	22	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	32	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	22	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	11	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	29	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	14	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	13	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	13	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	11	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	13	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	11	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	10	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	11	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	11	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	13	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Etheostoma fonticola	9	1
3242	Landa Lake	Bryo-2	2024-10-30	1	Palaemonetes sp.		3
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	30	1
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	32	1

3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	9	1
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	10	1
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	30	1
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	15	1
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	14	1
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	12	1
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	10	1
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	11	1
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	11	1
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	13	1
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	11	1
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	10	1
3242	Landa Lake	Bryo-2	2024-10-30	2	Etheostoma fonticola	12	1
3221	Upper Spring Run	Sag-1	2024-10-29	1	No fish collected		
3221	Upper Spring Run	Sag-1	2024-10-29	2	Micropterus salmoides	111	1
3221	Upper Spring Run	Sag-1	2024-10-29	3	Lepomis miniatus	72	1
3221	Upper Spring Run	Sag-1	2024-10-29	4	No fish collected		
3221	Upper Spring Run	Sag-1	2024-10-29	5	Procambarus sp.		1
3221	Upper Spring Run	Sag-1	2024-10-29	6	No fish collected		
3221	Upper Spring Run	Sag-1	2024-10-29	7	Lepomis miniatus	55	1
3221	Upper Spring Run	Sag-1	2024-10-29	7	Lepomis miniatus	65	1
3221	Upper Spring Run	Sag-1	2024-10-29	8	No fish collected		
3221	Upper Spring Run	Sag-1	2024-10-29	9	Lepomis miniatus	56	1
3221	Upper Spring Run	Sag-1	2024-10-29	10	No fish collected		
3221	Upper Spring Run	Sag-1	2024-10-29	11	Procambarus sp.		1
3221	Upper Spring Run	Sag-1	2024-10-29	12	No fish collected		
3221	Upper Spring Run	Sag-1	2024-10-29	13	No fish collected		
3221	Upper Spring Run	Sag-1	2024-10-29	14	No fish collected		
3221	Upper Spring Run	Sag-1	2024-10-29	15	Procambarus sp.		1
3243	Landa Lake	Sag-1	2024-10-30	1	No fish collected		

3243	Landa Lake	Sag-1	2024-10-30	2	Procambarus sp.		1
3243	Landa Lake	Sag-1	2024-10-30	2	Lepomis miniatus	27	1
3243	Landa Lake	Sag-1	2024-10-30	3	Lepomis miniatus	46	1
3243	Landa Lake	Sag-1	2024-10-30	3	Procambarus sp.		2
3243	Landa Lake	Sag-1	2024-10-30	3	Etheostoma fonticola	34	1
3243	Landa Lake	Sag-1	2024-10-30	3	Etheostoma fonticola	28	1
3243	Landa Lake	Sag-1	2024-10-30	4	Procambarus sp.		1
3243	Landa Lake	Sag-1	2024-10-30	5	Palaemonetes sp.		2
3243	Landa Lake	Sag-1	2024-10-30	6	Procambarus sp.		1
3243	Landa Lake	Sag-1	2024-10-30	7	Procambarus sp.		1
3243	Landa Lake	Sag-1	2024-10-30	7	Etheostoma fonticola	18	1
3243	Landa Lake	Sag-1	2024-10-30	8	Procambarus sp.		1
3243	Landa Lake	Sag-1	2024-10-30	9	Dionda nigrotaeniata	55	1
3243	Landa Lake	Sag-1	2024-10-30	10	Procambarus sp.		1
3243	Landa Lake	Sag-1	2024-10-30	11	No fish collected		
3243	Landa Lake	Sag-1	2024-10-30	12	Herichthys cyanoguttatus	44	1
3243	Landa Lake	Sag-1	2024-10-30	13	Procambarus sp.		1
3243	Landa Lake	Sag-1	2024-10-30	14	Procambarus sp.		1
3243	Landa Lake	Sag-1	2024-10-30	15	Ameiurus natalis	113	1
3243	Landa Lake	Sag-1	2024-10-30	15	Procambarus sp.		1
3244	Landa Lake	Sag-2	2024-10-30	1	Lepomis miniatus	125	1
3244	Landa Lake	Sag-2	2024-10-30	1	Procambarus sp.		1
3244	Landa Lake	Sag-2	2024-10-30	2	Procambarus sp.		3
3244	Landa Lake	Sag-2	2024-10-30	3	Procambarus sp.		1
3244	Landa Lake	Sag-2	2024-10-30	4	No fish collected		
3244	Landa Lake	Sag-2	2024-10-30	5	Procambarus sp.		1
3244	Landa Lake	Sag-2	2024-10-30	6	Herichthys cyanoguttatus	24	1
3244	Landa Lake	Sag-2	2024-10-30	6	Procambarus sp.		1
3244	Landa Lake	Sag-2	2024-10-30	6	Ameiurus natalis	63	1
3244	Landa Lake	Sag-2	2024-10-30	7	Procambarus sp.		2

3244	Landa Lake	Sag-2	2024-10-30	8	No fish collected		
3244	Landa Lake	Sag-2	2024-10-30	9	Procambarus sp.		1
3244	Landa Lake	Sag-2	2024-10-30	10	Procambarus sp.		1
3244	Landa Lake	Sag-2	2024-10-30	11	Procambarus sp.		3
3244	Landa Lake	Sag-2	2024-10-30	12	No fish collected		
3244	Landa Lake	Sag-2	2024-10-30	13	Procambarus sp.		1
3244	Landa Lake	Sag-2	2024-10-30	14	No fish collected		
3244	Landa Lake	Sag-2	2024-10-30	15	Procambarus sp.		1
3245	Landa Lake	Lud-1	2024-10-30	1	Procambarus sp.		4
3245	Landa Lake	Lud-1	2024-10-30	2	No fish collected		
3245	Landa Lake	Lud-1	2024-10-30	3	Procambarus sp.		2
3245	Landa Lake	Lud-1	2024-10-30	4	Etheostoma fonticola	27	1
3245	Landa Lake	Lud-1	2024-10-30	4	Etheostoma fonticola	26	1
3245	Landa Lake	Lud-1	2024-10-30	4	Etheostoma fonticola	31	1
3245	Landa Lake	Lud-1	2024-10-30	4	Etheostoma fonticola	31	1
3245	Landa Lake	Lud-1	2024-10-30	4	Dionda nigrotaeniata	31	1
3245	Landa Lake	Lud-1	2024-10-30	5	Etheostoma fonticola	31	1
3245	Landa Lake	Lud-1	2024-10-30	5	Etheostoma fonticola	24	1
3245	Landa Lake	Lud-1	2024-10-30	5	Etheostoma fonticola	28	1
3245	Landa Lake	Lud-1	2024-10-30	5	Lepomis sp.	11	1
3245	Landa Lake	Lud-1	2024-10-30	6	No fish collected		
3245	Landa Lake	Lud-1	2024-10-30	7	Palaemonetes sp.		1
3245	Landa Lake	Lud-1	2024-10-30	8	Lepomis miniatus	65	1
3245	Landa Lake	Lud-1	2024-10-30	8	Dionda nigrotaeniata	62	1
3245	Landa Lake	Lud-1	2024-10-30	8	Etheostoma fonticola	25	1
3245	Landa Lake	Lud-1	2024-10-30	9	Procambarus sp.		2
3245	Landa Lake	Lud-1	2024-10-30	10	No fish collected		
3245	Landa Lake	Lud-1	2024-10-30	11	Procambarus sp.		1
3245	Landa Lake	Lud-1	2024-10-30	12	No fish collected		
3245	Landa Lake	Lud-1	2024-10-30	13	No fish collected		

3245	Landa Lake	Lud-1	2024-10-30	14	Palaemonetes sp.		1
3245	Landa Lake	Lud-1	2024-10-30	15	No fish collected		
3246	Landa Lake	Cab-1	2024-10-30	1	Etheostoma fonticola	33	1
3246	Landa Lake	Cab-1	2024-10-30	1	Procambarus sp.		1
3246	Landa Lake	Cab-1	2024-10-30	1	Palaemonetes sp.		2
3246	Landa Lake	Cab-1	2024-10-30	2	Procambarus sp.		2
3246	Landa Lake	Cab-1	2024-10-30	2	Palaemonetes sp.		1
3246	Landa Lake	Cab-1	2024-10-30	2	Etheostoma fonticola	30	1
3246	Landa Lake	Cab-1	2024-10-30	2	Etheostoma fonticola	33	1
3246	Landa Lake	Cab-1	2024-10-30	3	Procambarus sp.		1
3246	Landa Lake	Cab-1	2024-10-30	3	Etheostoma fonticola	33	1
3246	Landa Lake	Cab-1	2024-10-30	3	Etheostoma fonticola	28	1
3246	Landa Lake	Cab-1	2024-10-30	3	Etheostoma fonticola	28	1
3246	Landa Lake	Cab-1	2024-10-30	3	Etheostoma fonticola	30	1
3246	Landa Lake	Cab-1	2024-10-30	3	Lepomis miniatus	77	1
3246	Landa Lake	Cab-1	2024-10-30	3	Palaemonetes sp.		1
3246	Landa Lake	Cab-1	2024-10-30	3	Lepomis sp.	15	1
3246	Landa Lake	Cab-1	2024-10-30	4	No fish collected		
3246	Landa Lake	Cab-1	2024-10-30	5	Palaemonetes sp.		1
3246	Landa Lake	Cab-1	2024-10-30	6	No fish collected		
3246	Landa Lake	Cab-1	2024-10-30	7	Etheostoma fonticola	20	1
3246	Landa Lake	Cab-1	2024-10-30	8	No fish collected		
3246	Landa Lake	Cab-1	2024-10-30	9	Astyanax mexicanus	14	1
3246	Landa Lake	Cab-1	2024-10-30	10	No fish collected		
3246	Landa Lake	Cab-1	2024-10-30	11	No fish collected		
3246	Landa Lake	Cab-1	2024-10-30	12	Procambarus sp.		1
3246	Landa Lake	Cab-1	2024-10-30	13	No fish collected		
3246	Landa Lake	Cab-1	2024-10-30	14	No fish collected		
3246	Landa Lake	Cab-1	2024-10-30	15	No fish collected		
3247	Landa Lake	Cab-2	2024-10-30	1	Lepomis miniatus	87	1

3247	Landa Lake	Cab-2	2024-10-30	1	Etheostoma fonticola	30	1
3247	Landa Lake	Cab-2	2024-10-30	1	Etheostoma fonticola	34	1
3247	Landa Lake	Cab-2	2024-10-30	1	Etheostoma fonticola	27	1
3247	Landa Lake	Cab-2	2024-10-30	1	Palaemonetes sp.		6
3247	Landa Lake	Cab-2	2024-10-30	1	Procambarus sp.		1
3247	Landa Lake	Cab-2	2024-10-30	2	Procambarus sp.		1
3247	Landa Lake	Cab-2	2024-10-30	3	Lepomis miniatus	35	1
3247	Landa Lake	Cab-2	2024-10-30	3	Palaemonetes sp.		2
3247	Landa Lake	Cab-2	2024-10-30	4	No fish collected		
3247	Landa Lake	Cab-2	2024-10-30	5	Lepomis miniatus	48	1
3247	Landa Lake	Cab-2	2024-10-30	5	Etheostoma fonticola	32	1
3247	Landa Lake	Cab-2	2024-10-30	6	No fish collected		
3247	Landa Lake	Cab-2	2024-10-30	7	No fish collected		
3247	Landa Lake	Cab-2	2024-10-30	8	No fish collected		
3247	Landa Lake	Cab-2	2024-10-30	9	No fish collected		
3247	Landa Lake	Cab-2	2024-10-30	10	No fish collected		
3247	Landa Lake	Cab-2	2024-10-30	11	No fish collected		
3247	Landa Lake	Cab-2	2024-10-30	12	No fish collected		
3247	Landa Lake	Cab-2	2024-10-30	13	No fish collected		
3247	Landa Lake	Cab-2	2024-10-30	14	Palaemonetes sp.		1
3247	Landa Lake	Cab-2	2024-10-30	15	Procambarus sp.		1
3248	Landa Lake	Lud-2	2024-10-30	1	Lepomis miniatus	30	1
3248	Landa Lake	Lud-2	2024-10-30	1	Lepomis sp.	12	1
3248	Landa Lake	Lud-2	2024-10-30	1	Palaemonetes sp.		1
3248	Landa Lake	Lud-2	2024-10-30	2	Procambarus sp.		1
3248	Landa Lake	Lud-2	2024-10-30	2	Etheostoma fonticola	32	1
3248	Landa Lake	Lud-2	2024-10-30	3	Procambarus sp.		1
3248	Landa Lake	Lud-2	2024-10-30	3	Etheostoma fonticola	14	1
3248	Landa Lake	Lud-2	2024-10-30	4	Procambarus sp.		1
3248	Landa Lake	Lud-2	2024-10-30	4	Etheostoma fonticola	29	1

3248	Landa Lake	Lud-2	2024-10-30	4	Etheostoma fonticola	31	1
3248	Landa Lake	Lud-2	2024-10-30	4	Palaemonetes sp.		1
3248	Landa Lake	Lud-2	2024-10-30	5	Micropterus salmoides	50	1
3248	Landa Lake	Lud-2	2024-10-30	6	Procambarus sp.		2
3248	Landa Lake	Lud-2	2024-10-30	6	Etheostoma fonticola	30	1
3248	Landa Lake	Lud-2	2024-10-30	7	Dionda nigrotaeniata	54	1
3248	Landa Lake	Lud-2	2024-10-30	7	Etheostoma fonticola	32	1
3248	Landa Lake	Lud-2	2024-10-30	7	Ameiurus natalis	14	1
3248	Landa Lake	Lud-2	2024-10-30	7	Procambarus sp.		1
3248	Landa Lake	Lud-2	2024-10-30	8	Procambarus sp.		1
3248	Landa Lake	Lud-2	2024-10-30	9	Procambarus sp.		1
3248	Landa Lake	Lud-2	2024-10-30	10	Procambarus sp.		2
3248	Landa Lake	Lud-2	2024-10-30	11	Procambarus sp.		1
3248	Landa Lake	Lud-2	2024-10-30	12	Procambarus sp.		1
3248	Landa Lake	Lud-2	2024-10-30	12	Lepomis miniatus	30	1
3248	Landa Lake	Lud-2	2024-10-30	13	Procambarus sp.		1
3248	Landa Lake	Lud-2	2024-10-30	13	Etheostoma fonticola	29	1
3248	Landa Lake	Lud-2	2024-10-30	14	Procambarus sp.		2
3248	Landa Lake	Lud-2	2024-10-30	14	Etheostoma fonticola	31	1
3248	Landa Lake	Lud-2	2024-10-30	15	Procambarus sp.		2
3248	Landa Lake	Lud-2	2024-10-30	15	Etheostoma fonticola	28	1
3248	Landa Lake	Lud-2	2024-10-30	16	Etheostoma fonticola	31	1
3248	Landa Lake	Lud-2	2024-10-30	17	No fish collected		
3249	Upper New Channel Reach	Open-1	2024-10-31	1	No fish collected		
3249	Upper New Channel Reach	Open-1	2024-10-31	2	No fish collected		
3249	Upper New Channel Reach	Open-1	2024-10-31	3	No fish collected		
3249	Upper New Channel Reach	Open-1	2024-10-31	4	No fish collected		
3249	Upper New Channel Reach	Open-1	2024-10-31	5	No fish collected		
3249	Upper New Channel Reach	Open-1	2024-10-31	6	No fish collected		
3249	Upper New Channel Reach	Open-1	2024-10-31	7	No fish collected		

3249	Upper New Channel Reach	Open-1	2024-10-31	8	No fish collected		
3249	Upper New Channel Reach	Open-1	2024-10-31	9	No fish collected		
3249	Upper New Channel Reach	Open-1	2024-10-31	10	No fish collected		
3250	Upper New Channel Reach	Open-2	2024-10-31	1	No fish collected		
3250	Upper New Channel Reach	Open-2	2024-10-31	2	No fish collected		
3250	Upper New Channel Reach	Open-2	2024-10-31	3	No fish collected		
3250	Upper New Channel Reach	Open-2	2024-10-31	4	No fish collected		
3250	Upper New Channel Reach	Open-2	2024-10-31	5	No fish collected		
3250	Upper New Channel Reach	Open-2	2024-10-31	6	No fish collected		
3250	Upper New Channel Reach	Open-2	2024-10-31	7	No fish collected		
3250	Upper New Channel Reach	Open-2	2024-10-31	8	No fish collected		
3250	Upper New Channel Reach	Open-2	2024-10-31	9	No fish collected		
3250	Upper New Channel Reach	Open-2	2024-10-31	10	No fish collected		
3222	Upper Spring Run	Sag-2	2024-10-29	1	No fish collected		
3222	Upper Spring Run	Sag-2	2024-10-29	2	No fish collected		
3222	Upper Spring Run	Sag-2	2024-10-29	3	Lepomis miniatus	59	1
3222	Upper Spring Run	Sag-2	2024-10-29	4	No fish collected		
3222	Upper Spring Run	Sag-2	2024-10-29	5	No fish collected		
3222	Upper Spring Run	Sag-2	2024-10-29	6	No fish collected		
3222	Upper Spring Run	Sag-2	2024-10-29	7	No fish collected		
3222	Upper Spring Run	Sag-2	2024-10-29	8	No fish collected		
3222	Upper Spring Run	Sag-2	2024-10-29	9	No fish collected		
3222	Upper Spring Run	Sag-2	2024-10-29	10	Procambarus sp.		1
3222	Upper Spring Run	Sag-2	2024-10-29	11	No fish collected		
3222	Upper Spring Run	Sag-2	2024-10-29	12	No fish collected		
3222	Upper Spring Run	Sag-2	2024-10-29	13	No fish collected		
3223	Upper Spring Run	Cab-1	2024-10-29	1	No fish collected		
3223	Upper Spring Run	Cab-1	2024-10-29	2	Procambarus sp.		1
3223	Upper Spring Run	Cab-1	2024-10-29	3	Etheostoma lepidum	61	1
3223	Upper Spring Run	Cab-1	2024-10-29	3	Herichthys cyanoguttatus	45	1

3223	Upper Spring Run	Cab-1	2024-10-29	3	Palaemonetes sp.		1
3223	Upper Spring Run	Cab-1	2024-10-29	4	Procambarus sp.		1
3223	Upper Spring Run	Cab-1	2024-10-29	5	Lepomis sp.	16	1
3223	Upper Spring Run	Cab-1	2024-10-29	5	Lepomis sp.	18	1
3223	Upper Spring Run	Cab-1	2024-10-29	5	Lepomis sp.	11	1
3223	Upper Spring Run	Cab-1	2024-10-29	5	Procambarus sp.		1
3223	Upper Spring Run	Cab-1	2024-10-29	6	No fish collected		
3223	Upper Spring Run	Cab-1	2024-10-29	7	No fish collected		
3223	Upper Spring Run	Cab-1	2024-10-29	8	Lepomis miniatus	28	1
3223	Upper Spring Run	Cab-1	2024-10-29	9	Lepomis miniatus	66	1
3223	Upper Spring Run	Cab-1	2024-10-29	10	Etheostoma lepidum	38	1
3223	Upper Spring Run	Cab-1	2024-10-29	10	Procambarus sp.		1
3223	Upper Spring Run	Cab-1	2024-10-29	11	Lepomis miniatus	79	1
3223	Upper Spring Run	Cab-1	2024-10-29	12	Procambarus sp.		1
3223	Upper Spring Run	Cab-1	2024-10-29	13	No fish collected		
3223	Upper Spring Run	Cab-1	2024-10-29	14	No fish collected		
3223	Upper Spring Run	Cab-1	2024-10-29	15	Procambarus sp.		1
3224	Upper Spring Run	Cab-2	2024-10-29	1	Lepomis miniatus	104	1
3224	Upper Spring Run	Cab-2	2024-10-29	1	Astyanax mexicanus	42	1
3224	Upper Spring Run	Cab-2	2024-10-29	2	Procambarus sp.		1
3224	Upper Spring Run	Cab-2	2024-10-29	2	Micropterus salmoides	70	1
3224	Upper Spring Run	Cab-2	2024-10-29	3	Herichthys cyanoguttatus	130	1
3224	Upper Spring Run	Cab-2	2024-10-29	3	Astyanax mexicanus	35	1
3224	Upper Spring Run	Cab-2	2024-10-29	3	Procambarus sp.		1
3224	Upper Spring Run	Cab-2	2024-10-29	4	No fish collected		
3224	Upper Spring Run	Cab-2	2024-10-29	5	Lepomis miniatus	110	1
3224	Upper Spring Run	Cab-2	2024-10-29	5	Lepomis sp.	15	1
3224	Upper Spring Run	Cab-2	2024-10-29	6	Lepomis sp.	11	1
3224	Upper Spring Run	Cab-2	2024-10-29	7	Lepomis miniatus	59	1
3224	Upper Spring Run	Cab-2	2024-10-29	8	Micropterus salmoides	57	1

3224	Upper Spring Run	Cab-2	2024-10-29	9	Lepomis miniatus	71	1
3224	Upper Spring Run	Cab-2	2024-10-29	9	Lepomis miniatus	95	1
3224	Upper Spring Run	Cab-2	2024-10-29	9	Lepomis sp.	10	1
3224	Upper Spring Run	Cab-2	2024-10-29	9	Procambarus sp.		2
3224	Upper Spring Run	Cab-2	2024-10-29	10	No fish collected		
3224	Upper Spring Run	Cab-2	2024-10-29	11	No fish collected		
3224	Upper Spring Run	Cab-2	2024-10-29	12	No fish collected		
3224	Upper Spring Run	Cab-2	2024-10-29	13	No fish collected		
3224	Upper Spring Run	Cab-2	2024-10-29	14	No fish collected		
3224	Upper Spring Run	Cab-2	2024-10-29	15	No fish collected		
3251	Upper New Channel Reach	Hyg-1	2024-10-31	1	Lepomis miniatus	72	1
3251	Upper New Channel Reach	Hyg-1	2024-10-31	1	Palaemonetes sp.		2
3251	Upper New Channel Reach	Hyg-1	2024-10-31	1	Gambusia sp.	24	1
3251	Upper New Channel Reach	Hyg-1	2024-10-31	1	Gambusia sp.	25	1
3251	Upper New Channel Reach	Hyg-1	2024-10-31	2	Astyanax mexicanus	70	1
3251	Upper New Channel Reach	Hyg-1	2024-10-31	3	Palaemonetes sp.		1
3251	Upper New Channel Reach	Hyg-1	2024-10-31	4	Procambarus sp.		1
3251	Upper New Channel Reach	Hyg-1	2024-10-31	4	Palaemonetes sp.		1
3251	Upper New Channel Reach	Hyg-1	2024-10-31	5	Astyanax mexicanus	41	1
3251	Upper New Channel Reach	Hyg-1	2024-10-31	6	Lepomis cyanellus	75	1
3251	Upper New Channel Reach	Hyg-1	2024-10-31	7	Palaemonetes sp.		1
3251	Upper New Channel Reach	Hyg-1	2024-10-31	8	Palaemonetes sp.		1
3251	Upper New Channel Reach	Hyg-1	2024-10-31	9	No fish collected		
3251	Upper New Channel Reach	Hyg-1	2024-10-31	10	Lepomis sp.	18	1
3251	Upper New Channel Reach	Hyg-1	2024-10-31	11	Lepomis miniatus	50	1
3251	Upper New Channel Reach	Hyg-1	2024-10-31	12	No fish collected		
3251	Upper New Channel Reach	Hyg-1	2024-10-31	13	No fish collected		
3251	Upper New Channel Reach	Hyg-1	2024-10-31	14	Palaemonetes sp.		1
3251	Upper New Channel Reach	Hyg-1	2024-10-31	15	Lepomis cyanellus		75
3252	Upper New Channel Reach	Hyg-2	2024-10-31	1	Palaemonetes sp.		1

3252	Upper New Channel Reach	Hyg-2	2024-10-31	2	No fish collected		
3252	Upper New Channel Reach	Hyg-2	2024-10-31	3	No fish collected		
3252	Upper New Channel Reach	Hyg-2	2024-10-31	4	Procambarus sp.		1
3252	Upper New Channel Reach	Hyg-2	2024-10-31	4	Herichthys cyanoguttatus	38	1
3252	Upper New Channel Reach	Hyg-2	2024-10-31	5	No fish collected		
3252	Upper New Channel Reach	Hyg-2	2024-10-31	6	No fish collected		
3252	Upper New Channel Reach	Hyg-2	2024-10-31	7	Procambarus sp.		1
3252	Upper New Channel Reach	Hyg-2	2024-10-31	8	Procambarus sp.		1
3252	Upper New Channel Reach	Hyg-2	2024-10-31	9	No fish collected		
3252	Upper New Channel Reach	Hyg-2	2024-10-31	10	No fish collected		
3252	Upper New Channel Reach	Hyg-2	2024-10-31	11	No fish collected		
3252	Upper New Channel Reach	Hyg-2	2024-10-31	12	Procambarus sp.		1
3252	Upper New Channel Reach	Hyg-2	2024-10-31	13	No fish collected		
3252	Upper New Channel Reach	Hyg-2	2024-10-31	14	No fish collected		
3252	Upper New Channel Reach	Hyg-2	2024-10-31	15	Procambarus sp.		1
3253	Upper New Channel Reach	Cab-1	2024-10-31	1	Lepomis miniatus	72	1
3253	Upper New Channel Reach	Cab-1	2024-10-31	1	Poecilia latipinna	66	1
3253	Upper New Channel Reach	Cab-1	2024-10-31	2	Lepomis miniatus	100	1
3253	Upper New Channel Reach	Cab-1	2024-10-31	2	Lepomis gulosus	74	1
3253	Upper New Channel Reach	Cab-1	2024-10-31	2	Herichthys cyanoguttatus	45	1
3253	Upper New Channel Reach	Cab-1	2024-10-31	3	Lepomis miniatus	85	1
3253	Upper New Channel Reach	Cab-1	2024-10-31	3	Lepomis miniatus	84	1
3253	Upper New Channel Reach	Cab-1	2024-10-31	3	Lepomis miniatus	25	1
3253	Upper New Channel Reach	Cab-1	2024-10-31	4	No fish collected		
3253	Upper New Channel Reach	Cab-1	2024-10-31	5	Lepomis cyanellus	80	1
3253	Upper New Channel Reach	Cab-1	2024-10-31	6	Gambusia sp.	16	1
3253	Upper New Channel Reach	Cab-1	2024-10-31	6	Lepomis miniatus	88	1
3253	Upper New Channel Reach	Cab-1	2024-10-31	6	Procambarus sp.		1
3253	Upper New Channel Reach	Cab-1	2024-10-31	7	No fish collected		
3253	Upper New Channel Reach	Cab-1	2024-10-31	8	Procambarus sp.		2

3253	Upper New Channel Reach	Cab-1	2024-10-31	9	Herichthys cyanoguttatus	30	1
3253	Upper New Channel Reach	Cab-1	2024-10-31	10	No fish collected		
3253	Upper New Channel Reach	Cab-1	2024-10-31	11	No fish collected		
3253	Upper New Channel Reach	Cab-1	2024-10-31	12	Procambarus sp.		1
3253	Upper New Channel Reach	Cab-1	2024-10-31	13	No fish collected		
3253	Upper New Channel Reach	Cab-1	2024-10-31	14	No fish collected		
3253	Upper New Channel Reach	Cab-1	2024-10-31	15	No fish collected		
3254	Upper New Channel Reach	Cab-2	2024-10-31	1	Procambarus sp.		1
3254	Upper New Channel Reach	Cab-2	2024-10-31	2	Procambarus sp.		1
3254	Upper New Channel Reach	Cab-2	2024-10-31	3	Procambarus sp.		1
3254	Upper New Channel Reach	Cab-2	2024-10-31	3	Dionda nigrotaeniata	25	1
3254	Upper New Channel Reach	Cab-2	2024-10-31	3	Gambusia sp.	19	1
3254	Upper New Channel Reach	Cab-2	2024-10-31	4	No fish collected		
3254	Upper New Channel Reach	Cab-2	2024-10-31	5	Lepomis sp.	21	1
3254	Upper New Channel Reach	Cab-2	2024-10-31	6	No fish collected		
3254	Upper New Channel Reach	Cab-2	2024-10-31	7	No fish collected		
3254	Upper New Channel Reach	Cab-2	2024-10-31	8	Lepomis miniatus	30	1
3254	Upper New Channel Reach	Cab-2	2024-10-31	9	Lepomis gulosus	78	1
3254	Upper New Channel Reach	Cab-2	2024-10-31	10	Procambarus sp.		1
3254	Upper New Channel Reach	Cab-2	2024-10-31	11	Lepomis cyanellus	52	1
3254	Upper New Channel Reach	Cab-2	2024-10-31	12	No fish collected		
3254	Upper New Channel Reach	Cab-2	2024-10-31	13	No fish collected		
3254	Upper New Channel Reach	Cab-2	2024-10-31	14	No fish collected		
3254	Upper New Channel Reach	Cab-2	2024-10-31	15	No fish collected		

APPENDIX H: FOUNTAIN DARTER HABITAT SUITABILITY ANALYTICAL FRAMEWORK

OBJECTIVES

The goal of this analysis was to develop an index to quantify Fountain Darter habitat suitability within biological monitoring study reaches based on aquatic vegetation composition. Specific objectives included: (1) build Habitat Suitability Criteria (HSC) for each vegetation taxa; (2) use HSC to calculate an Overall Habitat Suitability Index (OHSI) based on vegetation community composition mapped at a given study reach during each monitoring event; (3) evaluate the efficacy of OHSI as a measure of Fountain Darter habitat suitability by testing whether Fountain Darter occurrence can be predicted based on OHSI.

METHODS

Habitat Suitability Criteria

HSC are a form of resource selection function (RSF) defined as any function that is proportional to the probability of use by an organism (Manly et al. 1993). HSC were built separately for the Comal and San Marcos river/springs systems using logistic regression based on random-station dip-net data and drop-net data converted to presence/absence. Logistic regression is a form of classification model that uses presence/absence data to predict probabilities based on a set of covariates (Hastie et al. 2009). The response variable for this analysis, probability of darter occurrence, was used to quantify criteria for each vegetation type, ranging from 0 (i.e., not suitable) to 1 (i.e., most suitable) (Figure H1).

OHSI Calculation

To calculate the OHSI for each monitoring event, HSC values for each vegetation strata were first multiplied by the areal coverage of that vegetation strata, and these values were summed across all vegetation strata within each study reach, to generate a Weighted Usable Area (WUA) of vegetation only as follows:

Eq. 1
$$WUA = \sum_{i=1}^{N}(A_i \ x \ HSC_i)$$

where N is the total number of vegetation types, A_i is the areal coverage of a single vegetation type, and HSC_i is the habitat suitability criteria of that single vegetation type (Yao & Bamal 2014).

This WUA was then divided by the total wetted area within the reach to generate OHSI, as follows:

Eq. 2
$$OHSI = \frac{WUA}{\sum_{i=1}^{N}(A_i)}$$

In this way, OHSI can also be thought of as the proportion of weighted usable area (Yao & Bamal 2014), ranging from 0 (unsuitable overall habitat) to 1 (most suitable overall habitat). Standardizing by reach size allows for a comparison of habitat quality between reaches of different sizes.

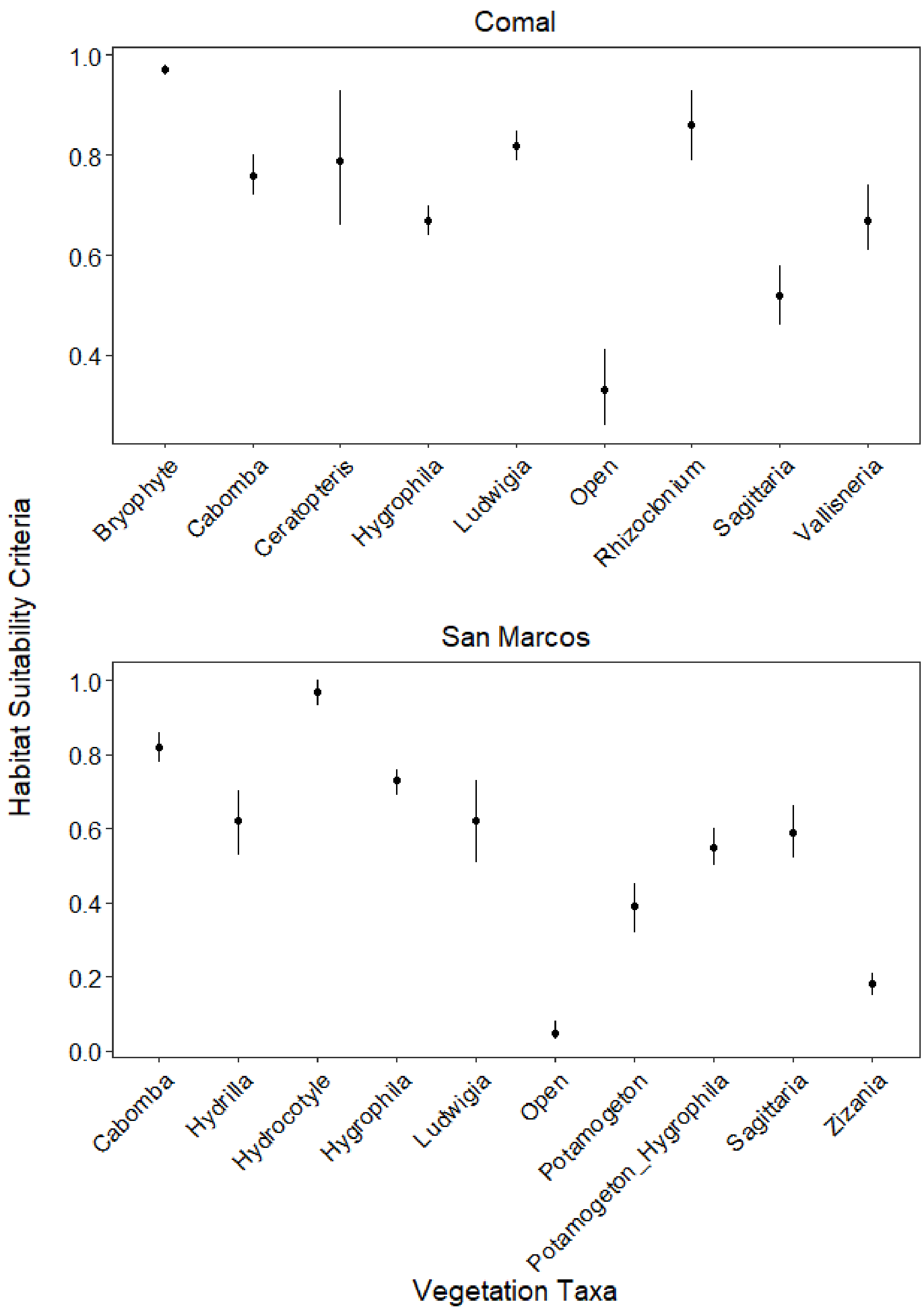

Figure H1. **Aquatic vegetation habitat suitability criteria (±95% CI) built with drop-net and random dip-net datasets using logistic regression.**

OHSI Evaluation

OHSI Evaluation Methods

To examine the relationship between OHSI and Fountain Darter population metrics, random-station dip-net data from 2017-2020 was organized in a way that treats each monitoring event per study reach as independent. This results in the response variable quantified as the proportional occurrence of Fountain Darters per reach at a given monitoring event based on the independent variable OHSI.

To predict Fountain Darter occurrence, two modeling approaches that are able to analyze proportions were used, which included: (1) GLM with a binomial distribution and (2) Random Forest Regression (RF). RF is an ensemble learning technique that builds many decision trees to predict a response variable (Breiman et al. 1984). Each decision tree of the "forest" is built by selecting a random subset of the dataset with replacement and a random set of covariates (Liaw & Wiener 2002). RF are considered more advantageous compared to traditional decision tree models and GLM because they correct for overfitting (Breiman 2001) and can provide more accurate predictions with many covariates (Cutler et al. 2007). For this analysis, we built RF models with 500 trees.

GLMs and RFs were built separately for the Comal and San Marcos systems. First, 50% of each dataset was randomly selected to train each model. Second, 5-fold cross validation (CV) was used to independently test the predictive performance of each model with the remaining 50% of the dataset (i.e., test data). Predictive performance was compared among models based on the correlation (R) and deviance (D) between observed and predicted values. Mean CV R ± standard error (SE) and CV D ± SE were calculated based on predictions from the 5 CV folds. Models with the highest CV R were considered as the best models for making predictions and elaborated on further in the results.

Lastly, figures were built to display fitted predictions across observed OHSI values to examine if there was a positive relationship between Fountain Darter occurrence and OHSI. Fitted predictions were also presented with a LOWESS smoothed function to visualize if trends of OHSI are linear or nonlinear (Milborrow 2020). In sum, if the models displayed strong predictive power and Fountain Darter occurrence showed a positive relationship with OHSI, then OHSI was considered a useful measurement of habitat suitability for Fountain Darters.

OHSI Evaluation Results

Predictive performance for the Comal models showed that RF (0.81 ± 0.18) predictions were more accurate than GLM (0.62 ± 0.20). San Marcos models were similar, showing better predictive accuracy for RF (0.97 ± 0.02) compared to GLM (0.93 ± 0.06) (Table H1). Comparisons between observed vs. predicted occurrence for the RF 5-fold CV demonstrated lowest predictive accuracy at observed proportions about 0.20 or less for the Comal and San Marcos (Figure H2).

Fitted predictions of occurrence as a function of OHSI showed that occurrence increased with increasing OHSI for the Comal and San Marcos. In the Comal, LOWESS smoothed predictions exhibited a non-linear asymptotic trend. Occurrence increased about 0.60 to 0.80 when OHSI increased from about 0.65 to 0.75 and remained around 0.80 at OHSI values >0.75. In the San Marcos, LOWESS smoothed predictions exhibited a more linear trend compared to the Comal and occurrence increased from about 0.25 to 0.55 as OHSI increased from 0.25 to 0.60 (Figure H3).

Table H1. Summary model performance statistics for predicting Fountain Darter occurrence based on OHSI. Summary statistics includes deviance (D) and correlation (R) for training data and 5-fold cross-validation (SE).

	Comal		San Marcos	
	GLM	RF	GLM	RF
Training Data				
Deviance	1.10	1.03	1.23	1.20
Correlation	0.48	0.77	0.70	0.89
Cross-Validation				
Deviance	1.12 (0.05)	1.05 (0.06)	1.24 (0.07)	1.21 (0.05)
Correlation	0.62 (0.20)	0.81 (0.18)	0.93 (0.06)	0.97 (0.02)

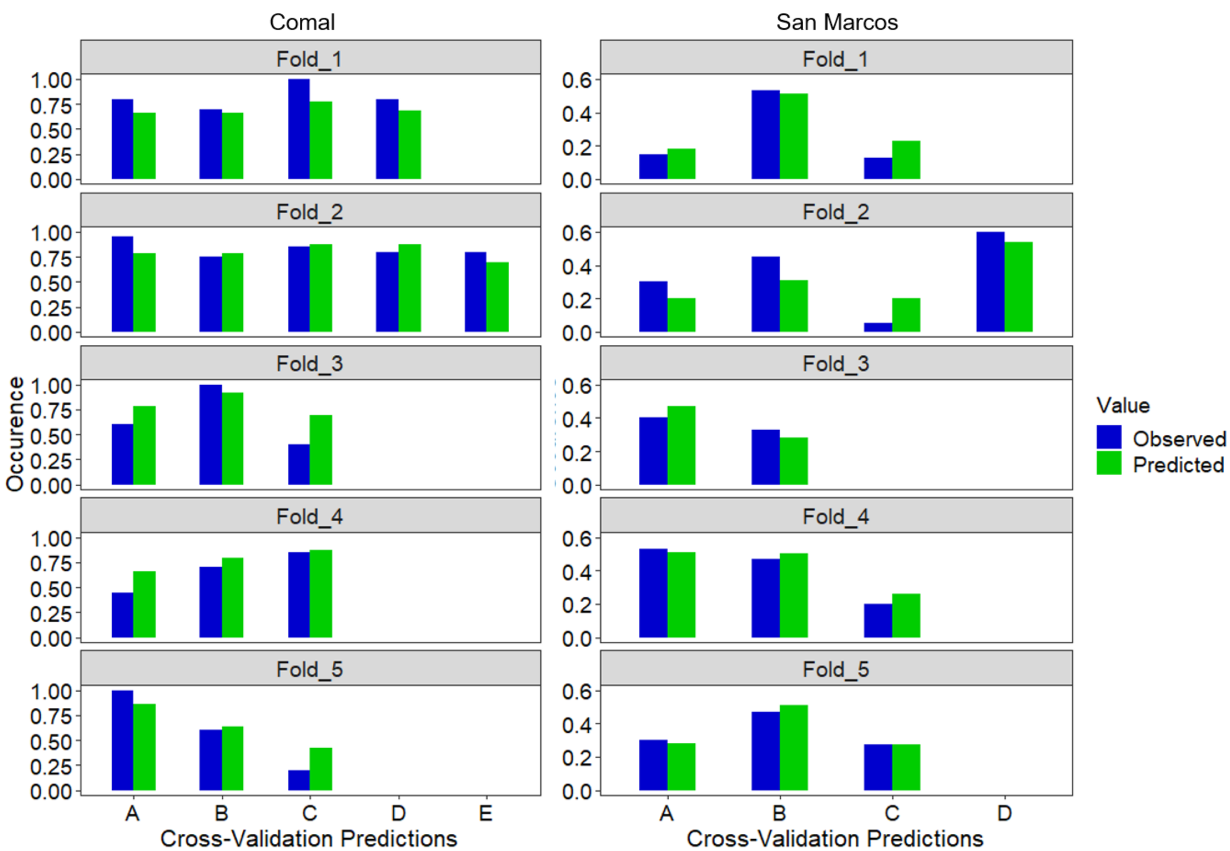

Figure H2. Observed vs. predicted Fountain Darter occurrence in relationship to OHSI from Random Forest 5-fold cross-validation.

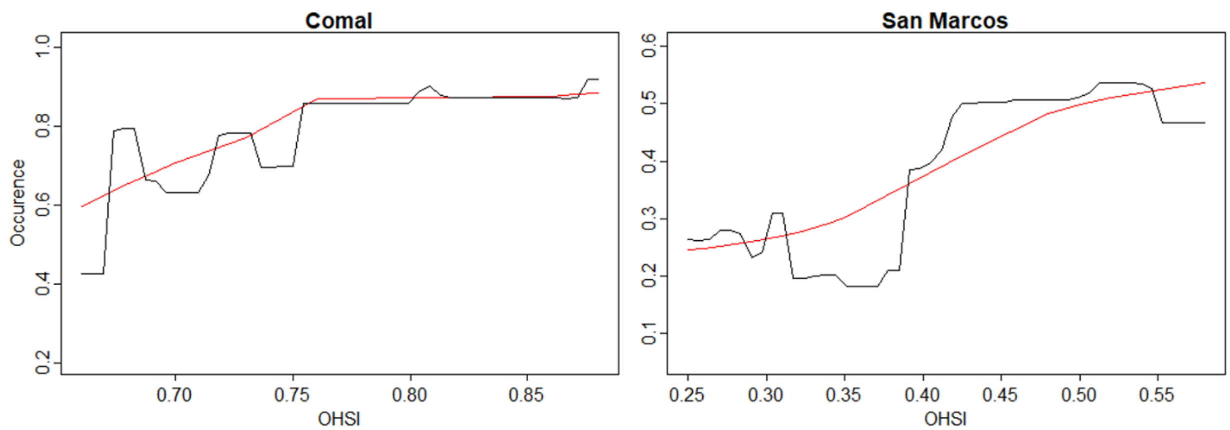

Figure H3. Fitted occurrence predictions for OHSI in the Comal Springs/River and San Marcos River. The red lines are LOWESS smoothed fitted predictions used to visualize nonlinear trends.

OHSI EVALUATION DISCUSSION

Model CV R >0.80 for all RFs demonstrate good model performance and that Fountain Darter occurrence can be accurately predicted based on OHSI. Further, similar performance statistics for training data and test data via cross-validation indicated that the training models were not overfit and can reliably predict independent observations in the future. That being said, predictions were least accurate at observed occurrence values about 0.20 or less, which is likely due to smaller sample sizes in this range. As random station dip-net sampling continues during future biomonitoring activities, predictions at these lower occurrence values will likely improve. Fountain Darter occurrence also increased with increasing OHSI. The positive relationship between occurrence and OHSI and good model performance supports that OHSI is an ecologically relevant index for evaluating Fountain Darter habitat suitability based on vegetation community composition.

In sum, this analysis demonstrated that OHSI based on vegetation-specific HSC and reach-level vegetation composition data can accurately predict Fountain Darter occurrence and is a useful measurement for quantifying habitat suitability. However, additional data collection can assist in addressing multiple limitations of this analysis. Firstly, random station dip-net data with simple random sampling is only available from about 2017-2020, which limits the ability to predict occurrence from historical observations. Further, model performance would likely improve at lower occurrence values as additional data are collected and a more robust dataset is generated. Secondly, this analysis assumed that vegetation alone determines Fountain Darter occurrence. For example, decreased predictive accuracy at lower darter occurrence values may be due to other habitat factors (e.g., depth-flow conditions, river discharge) or biotic factors (e.g., competition, predation) rather than due to smaller sample sizes of lower occurrence values; however, a multi-factor ecological model is beyond the scope of this work. In addition, OHSI can only be assessed for vegetation taxa that have been sampled previously and building HSC for rare vegetation taxa not represented may improve predictions. That being said, RF models demonstrated that occurrence can be predicted accurately without including additional habitat variables or vegetation types, supporting that this assumption does not hinder this analysis and does not appear to restrict the inference value of OHSI.

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